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A National Environmental/Energy Workforce Assessment. Region IV

National Field Research Center, Inc, Iowa City, Iowa

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Dec 77

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A National Environmental/Energy Workforce Assessment

REGION IV

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16. ABSTRACT

This study is one of 70 volumes assessing the workforce needs (manpower needs) for pollution control and abatement in the United States for the five-year period of 1976 through 1981. Seven fields for pollution control — air, noise, pesticides, potable water, radiation, solid waste, and wastewater — are analyzed, together with energy-related programs currently accentuated by the national effort to solve energy supply problems.

Designed as Phase I of a three-phase program, the complete assessment includes the following volumes: one each for the 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands; one for each of the ten EPA regions; a one-volume National Abstract; a volume on National Legislation; a volume on Business and Industry; and a four-volume National Summary. The information was gathered through extensive personal interviews with responsible federal, state, and local officials in every state; with officials of representative private industrial and commercial firms; and with representatives of national industrial and trade organizations.

Phase II will develop a broad national inventory of the entire range of post-secondary and higher education training offered in the pollution control and energy areas cited above, and Phase III will offer demonstrations for curriculum changes or modifications which appear necessary to assure an adequate and properly trained national environmental/energy workforce.

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Conducted by:

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Under Grant from:

UNITED STATES

ENVIRONMENTAL PROTECTION AGENCY

Grant #T900591010
1977

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Compiling information regarding Federal energy efforts in the Region required assistance also from professionals within those agencies under study. Most appreciated was the cooperation received from Mr. R.G. Jordan, Director of Safety and Environmental Health of the Union Carbide Corporation's Nuclear Division, and from Mr. Frank Bruce, Assistant Director for Administration of the Oak Ridge National Laboratory. No less valuable was the input of Mr. Fred Singleton, Director of Conservation, Environment, and Energy Resource Development and Mr. Roy Pettit, Deputy Administrator, both of the Federal Energy Administration. Assistance from Mr. Ken Clark, Public Information Officer for the Region II Nuclear Regulatory Commission also proved to be a noteworthy asset, as was the assistance of Mr. Roy Buffett of the Federal Power Commission. Finally, appreciation is due to Dr. Erik Schot of the Bendix Field Engineering Corporation and to Mr. David Peek, Assistant to the Manager of Public Affairs of the Savannah River Operations Office for providing information regarding activities of the Energy Research and Development Administration.

PREFACE

This study presents an overview of existing workforce levels, training programs, career potentials and major activities within the Region IV office of the U.S. Environmental Protection Agency (EPA). Staffing level projections (1977-1982) are also developed based upon available information. EPA program areas included in this report are: air, noise, pesticides, potable water, radiation, solid waste, and waste water. In addition, a section relating to Federal activities in the area of energy conversion/conservation has been included, providing similar information to that of the respective EPA sections.

This Regional report is designed to supplement eight additional reports, one for each State within Region IV. The information and data presented in this and the other reports were compiled largely as a result of interviews with professionals working in the respective areas. It should be pointed out that the data, where not documented by records, represent the best professional judgments of these experts.

FOREWORD

Information for this report was largely compiled from on-site interviews with professionals within the Region IV Environmental Protection Agency and within the Regional energy agencies under review. To strive for a higher degree of reliability, interviews were supplemented with telephone conversations for clarification and revalidation of information. It must be noted that a large portion of the information contained herein represents the best professional judgments of those persons surveyed. In cases where more than one person provided input into a single program area, compilation of figures and recommendations were provided by the author.

This report provides information concerning seven pollution control fields of the EPA, and contains synopses of federal energy-related programs within the boundaries of Region IV. The pollution control areas included are: air, noise, pesticides, potable water, radiation, solid waste, and waste water. Within EPA, the compartmentalization of employees into these seven areas is not a completely clearcut process. Functions occasionally overlap, inter-divisional cooperations occur, and certain components serve a supporting role to the entire Agency. Efforts were made in preparation of this report, however, to provide sufficient information for the reader to have an understanding of major linkages and roles, and to provide divisions of the workforce in a logical, realistic, and understandable manner.

While care was taken to provide comprehensive information regarding workforce levels, workforce projections, reasons for growth/decline, training programs and career potentials, as related by professionals, certain program functions have been summarized in the specific reports.

National Environmental Energy Workforce Assessment

Phase I

REGION IV

Report

REGIONAL PROFILE

Region IV consists of eight states in the southeasternmost portion of the United States. These states are: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee. Covering approximately 11% of the United States, the geography of the Region possesses no natural unity. Along the Region's northern Atlantic coastline is a low coastal plain, which rises to the "fall line" where an area known as the piedmont begins, where clay soils predominate in contrast to the sandy soils of the coastal areas, and the major portion of Florida. From the northern portions of Georgia and Alabama and portions of North Carolina and Tennessee, the piedmont rises into the Appalachian mountain system. Behind this main Appalachian Ridge lies the Cumberland Plateau, which dominates the western portion of North Carolina, the northern part of Georgia, and the eastern parts of Tennessee and Kentucky. The western portion of the Region lies in the Mississippi River Valley. In contrast to mountainous areas to the north, Florida has a flat terrain of very low elevation.

The Region, as a whole, is quite warm, the average annual temperature ranging from 75 degrees Fahrenheit in Miami, Florida to 56 degrees in the northern part of Kentucky. There is abundant rainfall, averaging 40 to 50 inches per annum in the upper portions of the Region, and 50 to 60 inches in the gulf coast area.

This Region has historically relied largely upon an agricultural economy. Although this trend has reversed somewhat, a strong agricultural base still does exist. Farthest to the south, Florida leads the nation in the production of oranges and grapefruit, and takes second place in the production of fresh vegetables. Tobacco is a leading crop in the Region, with North Carolina being the nation's largest producer, and Kentucky, South Carolina, and Tennessee follow closely behind. Mississippi is the nation's second leading producer of cotton, with North Carolina, South Carolina, Alabama, and Florida also contributing significant amounts. Georgia is first in peanut production, although other Region IV states also raise this crop. Peaches are a major commodity in the Region, especially in South Carolina and Georgia. Other major crops grown in the Region include rye, corn, soybeans, avocados, watermelons, and sweet potatoes. Livestock production, too, has grown significantly in the Region, now accounting for over half of all farm receipts. Hog and cattle production are major contributors to the economies of the Region as a whole, as is poultry and egg production.

Indicating the trend away from an agricultural economy is the decrease in farm population within the Region. According to the U.S. Bureau of the Census, between 1960 and 1970, an overall decrease of 48.8% of this population occurred. Statistics also show that the percentages of people living in metropolitan areas has been increasing at a faster rate than for the United States as a whole.

As has been indicated, industrialization is fairly recent phenomenon in the Region. With World War II and its aftermath, industrial developments and diversification revolutionized the economy within the South. By 1948, the value of cotton produced was surpassed by the value of textiles, and was rivaled by the values of chemical products, lumber products, petroleum products, and paper products, all of which had been increasing rapidly. While these industries remain important contributors to the Region's economy, diversification has continued to occur. Today, food processing remains an important industry in every state, as is furniture production. Other leading industries include iron and steel production in Alabama, liquor distilling in Kentucky, and fishing and tourism in Florida.

Natural resources also provide strong input into these states' economies. Coal mining plays a major role in Kentucky, and an increasingly greater role in surrounding states. Florida leads the nation in the production of phosphates, while Mississippi produces significant amounts of petroleum and natural gas. States in this Region are also leaders in the production of bauxite, asphalt, mica, marble, clay, titanium, kaolin, and cement.

Although per capita income in the South has risen sharply since the 1930's, the area still lags behind the United States as a whole. According to statistics published by the Bureau of the Census, as recently as 1974, the Region's average hourly earnings were $3.59 as compared to $4.40 for the U.S. as a whole, although this trend has reversed somewhat recently. Similarly, 1974 figures show that Region IV had the highest percentage of families below the low income level, and the highest percentage of families earning an income of less than $5,000 annually, as compared to all other Federal Regions.

In conclusion, the geography, the agricultural activities, the industrial outputs and the natural resources all provide the South a wide economic base and seemingly unlimited possibilities for the future. Agriculture typically has been, and probably will remain an important aspect of the economy of these States, while industry, although having grown tremendously in the past thirty years, is continuing to expand rapidly.

Agriculture and industry, alike, are often potential sources of pollution of the air, land, and water. Upgrading and maintaining the cleanliness and natural beauty of Region IV requires and will continue to require trained persons in all aspects of pollution control and abatement, both in the public and the private sector. With more stringent regulations, further knowledge and technical capability, and industrial expansion, it appears that Region IV's environmental workforce needs can only increase.

Organizational and Operational Structure

As stated in its Fiscal Year 1978-82 Preview, EPA Region IV supports the general EPA strategy, which is basically a two-pronged approach used to protect the nation's environment. The first strategy is to provide assistance to the State and local agencies, as well as to the public, to abate and control pollution. The second strategy is to present a strong enforcement posture, thereby assuring the public of EPA's regulatory capability to stop polluters found to be in violation of the laws. While there are other strategies operative, such as those of the research and development community and the public affairs (media) offices, these two represent the basic operational framework of the Regional Office activities.

The tactical elements of the first strategy are the well known programs that are funded by Congress, such as the monitoring programs, basin planning programs (including the 208 plans), and the State agency development programs under Sections 105 and 106 of the Clean Air Act and the Federal Water Pollution Control Act, respectively. The second, or regulatory, strategy employs tactical elements such as the NPDES program, SIP compliance program, Section 404 permits program, pesticides enforcement program and the legal services programs for each of the relevant acts of legislation.

While these two strategies may appear to be simple in concept, easily discernible in practice and independent in action, EPA views them as being mutually interdependent and supportive, in spite of the likelihood for the occurrence of competitive relationships within the program as a whole.

Region IV EPA expresses a full sense of partnership with the States within its Region. However, it also feels that a strong overview role requiring complete program capability is also required of EPA, in the event that States fail to act adequately, or more importantly, when EPA must support program requirements through direct assistance.

EPA's concern over the State and local agencies' lack of capacity to operate programs is evidenced in the review of the Regional EPA's Fiscal Year 1978 Intermedia Priority Objectives. To "develop within the State and local agencies the capacity to receive and administer the environmental program functions (authorities) which are delegable" is listed as a third priority objective. Additionally, throughout the complete listing of objectives, EPA continually emphasizes its own role in the encouragement and assistance to States and local agencies in assuming the needed responsibilities within specific areas, e.g.,water supply management, water quality management, and pesticides enforcement.

In addition to those already listed, some key objectives for Fiscal Year 1978 are to stress environmental accomplishments, since most initial pollution abatement treatment systems should be operable, to anticipate, rather than react to new problems, and to attain a proper balance of environmental management at the State and Federal levels. EPA feels itself to be lacking in resources, but believes that the States have the more acute needs.

The EPA Region IV organization is headed up by a Regional Administrator and a Deputy Regional Administrator, who are responsible for the overseeing and execution of regional and national programs within the boundaries of Region IV. Three staff offices exists, the first of which is the Assistant for Congressional and Intergovernmental Relations, which provides a point of contact with the Regional Office for matters pertaining to congressional and intergovernmental relations. The Civil Rights and Urban Affairs Office provides advice and assistance to the Regional Administrator and his staff on matters relating to the regional civil rights program, and the Public Affairs Office also advises the Administrator, but regarding matters relating to the regional public affairs program.

Headquarters activities in the Regional Office take place in two areas: in the Office of Regional Counsel and in Audit and Inspection Activities. The former provides legal advice and services to the Regional Administrator and his program and administrative staffs. This office is a component of the office of General Counsel at Headquarters. Audit and Inspection Activities are under the supervision of the Director of the Security and Inspection Office of the Office of Administration at Headquarters EPA, and audits personnel located in the Regional Office.

Five Divisions at the EPA Regional Office also carry out functions under the direction of the Regional Administrator. They are as follows (functions are abbreviated):

1) Management Division - Provides planning and management advice and services, and administrative management support to all components of the Regional office. Specific functions include personnel management, financial management, regional program planning, development and evaluation, budgeting, automatic data processing, safety and security, library services, facilities and space management, and general services.

2) Surveillance and Analysis Division - Conducts studies and collects, analyzes, and evaluates environmental quality data, directs and coordinates surveillance, pollution source inventory, and monitoring activities within the Region and provides necessary analytical support services. Directs the operation of subregional laboratory elements and provides advice and assistance to State and local

agencies concerning techniques, methodology, quality control, and laboratory support. Conducts special studies, investigations analysis and surveys, and implements regional monitoring programs. Directs and coordinates the review of other agencys' environmental impact statements (EIS) and prepares EIS's for EPA Region IV.

3) Enforcement Division - Recommends to the Regional Administrator goals, priorities, and objectives for the Regional Enforcement, Permits and Permits Administration Program, and is responsible for the development, coordination, implementation, and evaluation of these programs. Evaluates the current compliance status within the Region, establishes goals and priorities for improving the degree of compliance and selects strategies and techniques for achieving improvement.

4) Water Division - Recommends to the Regional Administrator goals, priorities, and objectives for the Regional Water Program, including the Water Supply Program, and is responsible for the development, coordination, implementation, and evaluation of these programs.

5) Air and Hazardous Materials Division - Recommends to the Regional Administrator goals, priorities, and objectives for the Regional Air, Noise, Radiation, Pesticides, Toxic Substances, Solid Waste Management, and R & D Technology Transfer Programs; and is responsible for the development, coordination, implementation, and evaluation of these programs.

According to an EPA computerized employee listing dated July, 1976, five hundred and fifty one persons were employed with the U.S. EPA Region IV. The following represents a breakdown by professional/skill level:

TABLE I

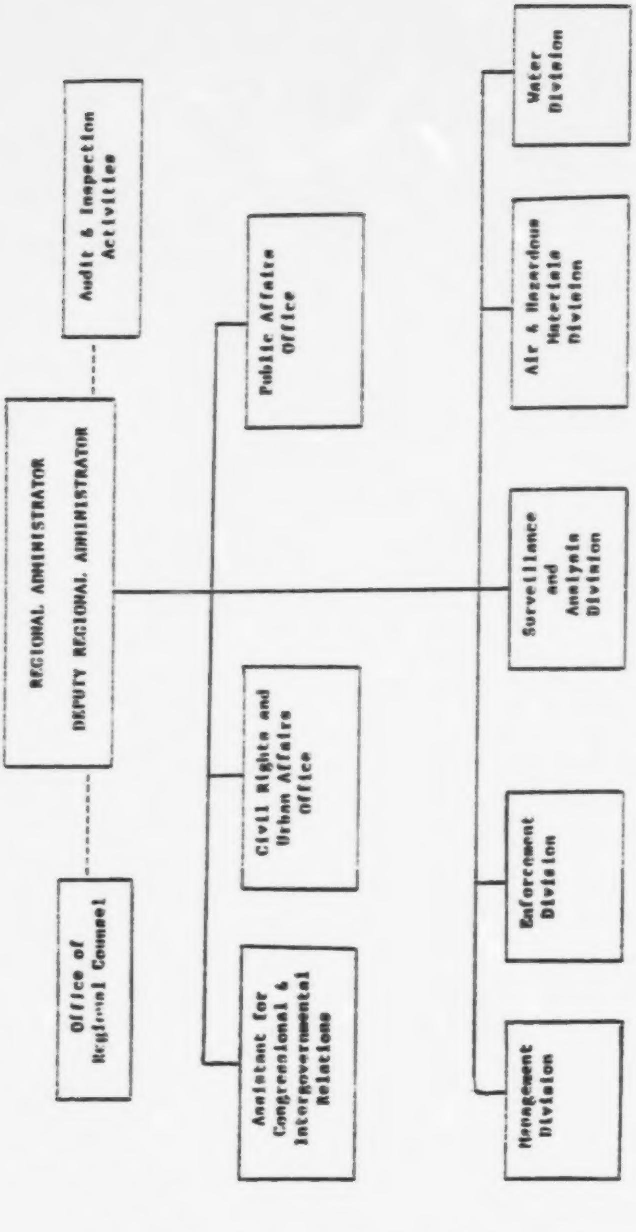
Staffing Level Figures for U.S. EPA Region IV

	1976	Anticipated %/annum growth to 1982 (Average)
Administrative	64	8%
Professional	318	10%
Technical	39	13%
Clerical	130	10%
TOTAL	551	

These figures include neither summer aides nor student trainees and assistants, who were listed in the printout. Five summer aides were employed at the time of the tally, as were thirty student aides and assistants. The latter performed a variety of functions and came from such backgrounds as law, engineering, data processing, and business administration.

It must be noted that in preparing the above table, a sizeable margin of error existed, which must be taken into consideration. For instance, placing persons into categories is largely a subjective procedure, especially when one is making determinations based mainly upon job titles. Possibilities exist in computer error, or in job titles not accurately representing a person's responsibilities or background. In addition, the anticipated annual growth rate to 1982 is necessarily a subjective figure, and is based upon combined best professional judgments of administrative EPA personnel. Information concerning specific EPA programs is contained in the following Section.

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
Figure 1


REGIONAL ADMINISTRATOR
DEPUTY REGIONAL ADMINISTRATOR
Office of Regional Counsel
Audit & Inspection Activities
Assistant for Congressional & Intergovernmental Relations
Civil Rights and Urban Affairs Office
Public Affairs Office
Management Division
Enforcement Division
Surveillance and Analysis Division
Air & Hazardous Materials Division
Water Division

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV

Figure 2

MANAGEMENT DIVISION

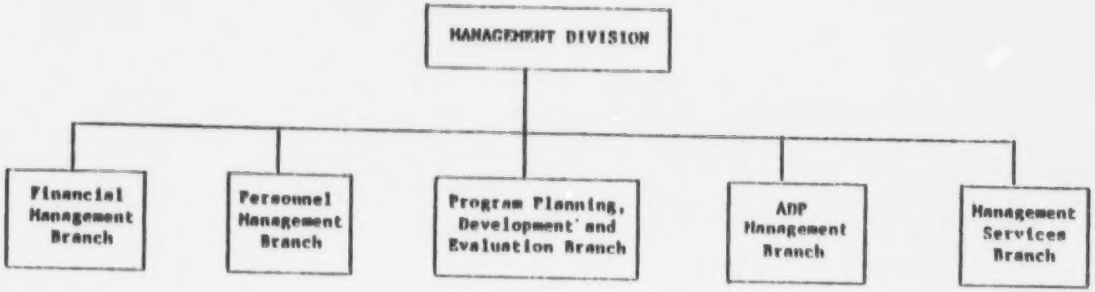

MANAGEMENT DIVISION
Financial Management Branch
Personnel Management Branch
Program Planning, Development and Evaluation Branch
ADP Management Branch
Management Services Branch

Figure 3

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
SURVEILLANCE AND ANALYSIS DIVISION

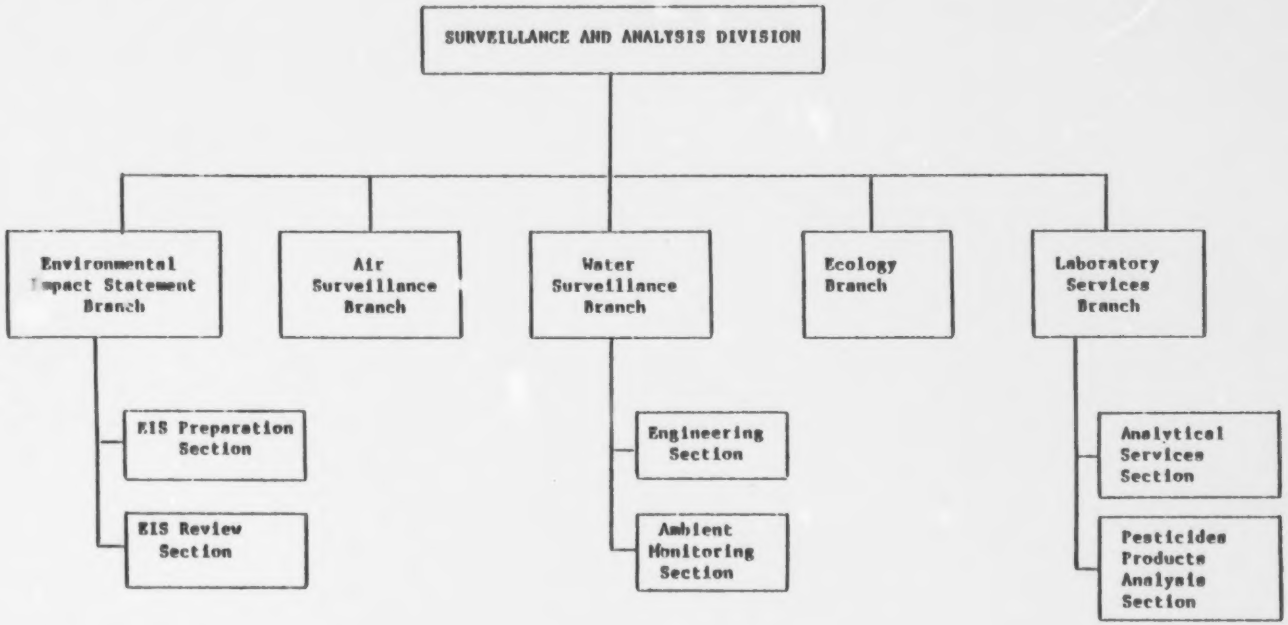

SURVEILLANCE AND ANALYSIS DIVISION
Environmental Impact Statement Branch
Air Surveillance Branch
Water Surveillance Branch
Ecology Branch
Laboratory Services Branch
EIS Preparation Section
EIS Review Section
Engineering Section
Ambient Monitoring Section
Analytical Services Section
Pesticides Products Analysis Section

Figure 4

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
ENFORCEMENT DIVISION

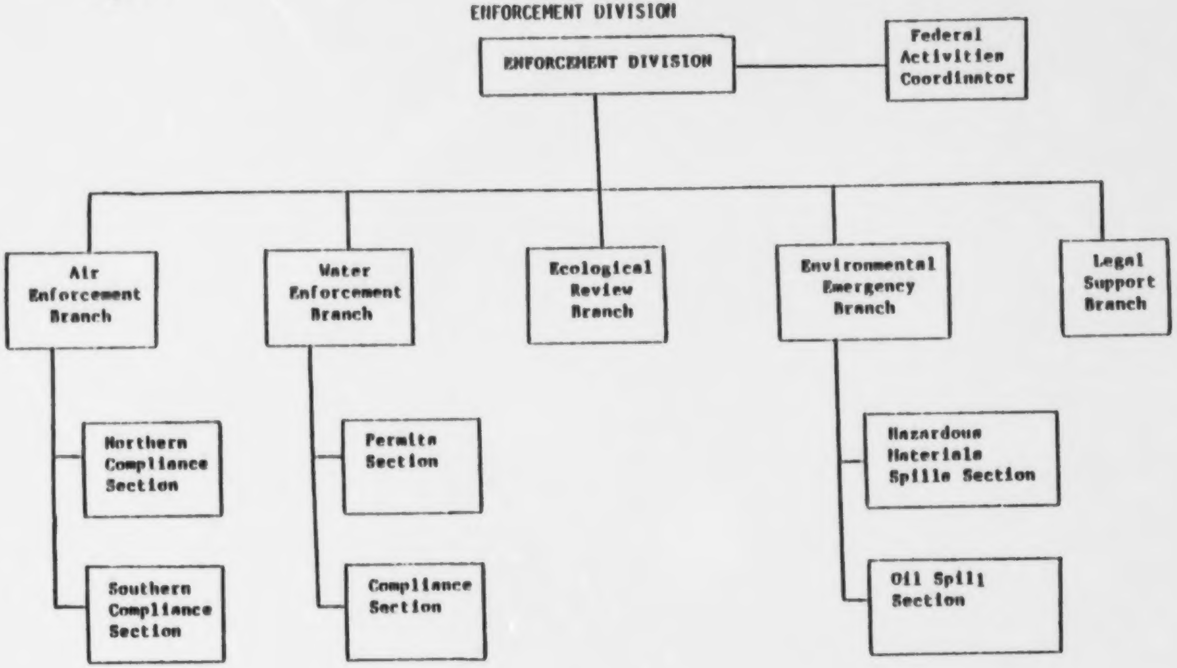

ENFORCEMENT DIVISION
Federal Activities Coordinator
Air Enforcement Branch
Water Enforcement Branch
Ecological Review Branch
Environmental Emergency Branch
Legal Support Branch
Northern Compliance Section
Southern Compliance Section
Permits Section
Compliance Section
Hazardous Materials Spills Section
Oil Spill Section

Figure 5

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
WATER DIVISION

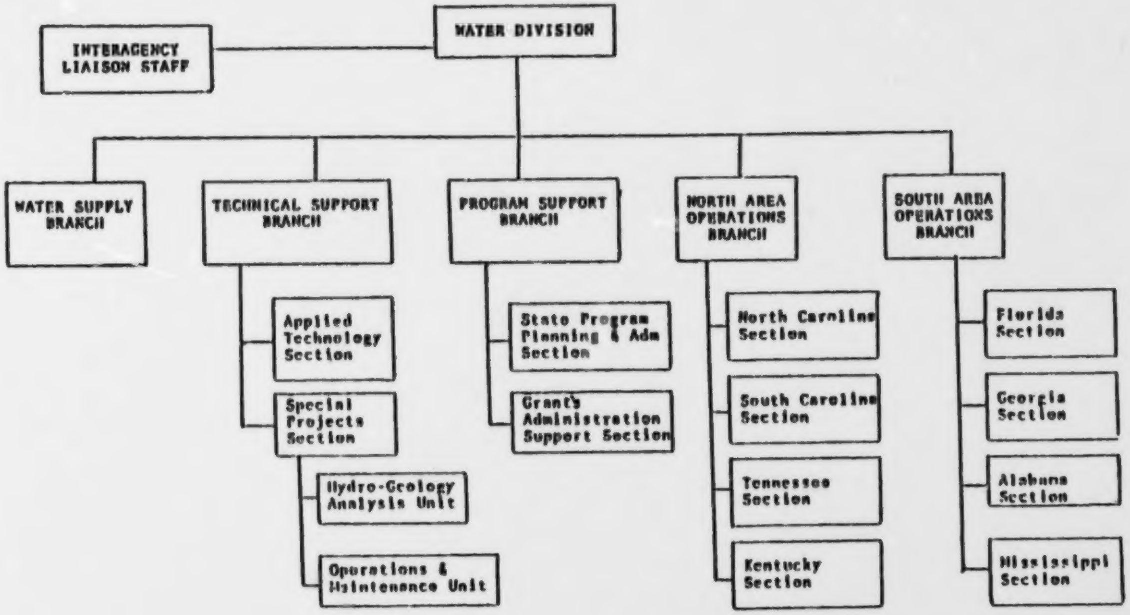
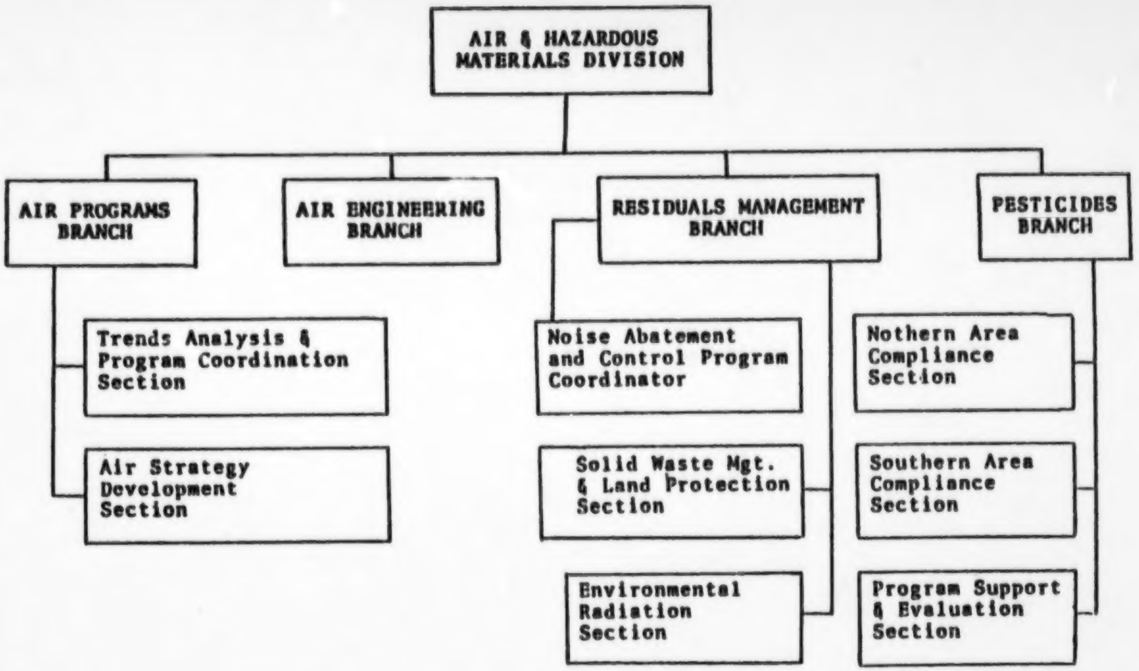

WATER DIVISION
INTERAGENCY LIAISON STAFF
WATER SUPPLY BRANCH
TECHNICAL SUPPORT BRANCH
Applied Technology Section
Special Projects Section
Hydro-Geology Analysis Unit
Operations & Maintenance Unit
PROGRAM SUPPORT BRANCH
State Program Planning & Adm Section
Grants Administration Support Section
NORTH AREA OPERATIONS BRANCH
North Carolina Section
South Carolina Section
Tennessee Section
Kentucky Section
SOUTH AREA OPERATIONS BRANCH
Florida Section
Georgia Section
Alabama Section
Mississippi Section

Figure 6

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
AIR AND HAZARDOUS MATERIALS DIVISION


AIR & HAZARDOUS MATERIALS DIVISION
AIR PROGRAMS BRANCH
AIR ENGINEERING BRANCH
RESIDUALS MANAGEMENT BRANCH
PESTICIDES BRANCH
Trends Analysis & Program Coordination Section
Air Strategy Development Section
Noise Abatement and Control Program Coordinator
Solid Waste Mgt. & Land Protection Section
Environmental Radiation Section
Nothern Area Compliance Section
Southern Area Compliance Section
Program Support & Evaluation Section

Regional Pollution Control and Abatement Programs

I. AIR

A. Workforce Profile

The bulk of the air pollution control activities at EPA Region IV takes place within the Air and Hazardous Materials Division, through the Air Programs Branch and the Air Engineering Branch. Though the activities are widespread and varied, most are mandated by the authority of the 1970 Clean Air Act,as amended. Specific emphasis is placed upon the following areas:

Section 109: National Ambient Air Quality Standards (NAAQS)
Section 110: State Implementation Plans (SIP) for prevention of the deterioration of Air Quality
Section 111: New source emission standards
Section 112: Emission standards for hazardous pollutants

The Air Programs Branch works with the States in developing Section 110 plans, distributes program grants under Section 105, conducts reviews of the states' progress, coordinates assistance to states in the implementation of the SIP's, and administers the prevention of significant deterioration program. Data handling of air measurements takes place in this Branch, as well as transportation planning and the review of Environmental Impact Statements.

The Air Engineering Branch consists of a pool of engineers that is available to the Air Programs Branch, Air Enforcement, and the Surveillance and Analysis Division for technical assistance in regard to special problems that arise. In addition, this branch implements the new source performance standards under Section 111 of the Clean Air Act.

The Air Surveillance Branch of EPA's Surveillance and Analysis Division is responsible for the ambient air quality monitoring programs based on regional and national needs. In coordination with the previously mentioned Branches, Air Surveillance conducts the field activities associated with short-term studies of ambient air quality problems, and provides technical assistance to Federal, State and local agencies.

The Air Enforcement Branch of the Enforcement Division is responsible for providing overall program policy and technical direction of the regional air enforcement activities and developing regionwide objectives and programs for air enforcement. The Legal Support Branch provides legal support, direction and strategy implementation.

Finally, the Laboratory Services Branch of the Surveillance and Analysis Division provides assistance with chemical and microbiological laboratory support. Support for regional program needs is handled through the analysis of samples and identification of pollutants.

Region IV's commitment to air pollution control is evidenced by reviewing the Proposed FY-78 Intermedia Priority List. The first of the First Priority Objectives is to "attain and maintain the National Ambient Air Quality Standards for the criteria pollutants by achieving compliance with SIP regulations ".

The following table represents the number of persons in Region IV EPA working full-time in air pollution control. As can be seen from the figures, engineers constitute the largest group within the total air program, with scientists being the second largest. It should be noted that the administrative and legal support offered to all environmental programs through other Region IV EPA components is not depicted in this table.

TABLE II

CURRENT (1976) REGION IV AIR POLLUTION CONTROL

STAFFING LEVEL

Air and Hazardous Materials Division
Air Programs and Air Engineering Branches

Position	1976
Engineer	
Civil	2
Sanitary	3
Environmental	4
Chemical	6
Mechanical	1
Industrial	1
(1) Meteorologist	1
(2) Scientist	1
Technician	7
Regional Staff on Loan to States	6
(3) Other	8
Total	42

Surveillance and Analysis Division,
Air Surveillance Branch

Scientist	5
Technician	2
Other	1
Total	8

Enforcement Division, Air Enforcement Branch

Engineer	
Environmental	4
Scientist	6
Technician	1
Trainee/Aide	1
Other	4
Total	16

Surveillance and Analysis Division

Laboratory Services Branch (est., in person-years)

Scientist	1
Technician	1
Total	2
Grand Total	68

(1) Through an Interagency agreement the National Oceanographic and Atmospheric Administration

(2) This category includes chemists, environmental protection specialists, ecologists, environmentalists

(3) This category includes clerical, writer, etc.

B. Workforce Projections

Averaging less than 5 percent for professional positions, turnover is fairly low within air programs, in general. Administrators attribute this low rate in part to the general state of the economy, and in part to competitive pay scales, upward mobility within the organization, and employee satisfaction with the work and working conditions.

Administrators have provided projections based upon past, present and anticipated future funding levels. In general, while certain functions will assuredly continue, such as regulating power plant emissions and plannning for maintenance of air quality standards, manpower growth within air pollution control at the federal level in the next five years will probably not be dramatic. Planning for strategies in non-attainment areas may require additional personnel in the next several years, and these people would later shift into plan implementation. Accordingly, there might be a five to ten percent increase in general environmental engineers and air resource planners over the next five year period, although demands may be higher.

The following table results from information derived from knowledgeable persons working directly within air pollution control at EPA. The figures represent a compilation of "best professional judgements", and figures noted earlier from separate Branches have been combined (figures do not include temporary aides or staff on loan to States).

TABLE III
WORKFORCE PROJECTIONS TO 1982 (est.)
AIR POLLUTION CONTROL

	1976	1977	1978	1979	1980	1981	% Average Per Annum growth/decline
Engineer	22	23	25	25	25	25	3%
Scientist	19	20	21	21	21	21	2%
Technician	6	6	6	6	6	6	0%
Sanitarian	1	1	1	1	1	1	0%
Other	13	13	13	13	13	13	0%
TOTAL	61	63	66	66	66	66	2%

The growth of Air Resource Planners is reflected in both the categories of "Engineer" and "Scientist" because the people who do this type of work come from a variety of backgrounds, including engineering, science and planning. Not included in this table are attorneys who, under the present structure, serve the entire Region through the Legal Support Branch.

The "percent average per annum growth/decline" figures are derived by first calculating each year's growth rate for each category. The sum of these figures under each category is then found, which is divided by the total number of years, or five.

C. Training and Certification

Upgrade training is offered to nearly every employee engaged in the field of air pollution control at Region IV EPA. Management, administrative, and basic skill-type courses are sponsored by the Civil Service Commission. In addition, EPA technical courses are offered, often through Research Triangle Park. Technical courses that are offered and taken advantage of include "Air Pollution Field Enforcement", "Principles and Practices of Air Pollution Control", "Meteorology", and "Combustion Evaluation". Administrators may become involved in an Executive Development Program, in which courses are offered mainly by EPA and the Civil Service Commission for the development of managerial skills. Regional air pollution administrators feel that their upgrade training program is among the best in the country.

Through the Surveillance and Analysis Division, courses are offered to State and local personnel engaged in pollution control. Although the main emphasis of training is upon waste water pollution control, five training courses in visible emissions evaluation were offered during Fiscal Year 1976. These were offered in Gulfport, Mississippi, and Athens, Georgia, and a total of 56 persons attended, the bulk of whom were from Region IV States. These training courses varied in length, from two to four days.

In addition, three workshops relating to air pollution control were conducted by the Surveillance and Analysis Division. They were as follows:

Course	Length		Attendance
Air Quality Control Coordinators' Meeting	2 days		34
Visible Emissions Quality Control Workshop	2 days		18
Visible Emissions Workshop	2 days		15
		TOTAL	67

Interdisciplinary training courses and workshops are also offered or sponsored by EPA through this Division. Training courses include "Accelerated Reading", "Introduction to Supervision", "Contract Officers' Course", "Basic Management Skills", and "EPA Grants Procedural Training Course". Interdisciplinary Workshops and seminars include "Preparation of Travel Vouchers", "Motivation and Productivity", and "Effective Communications".

Two courses on Visible Emissions Evaluation are scheduled to be taught at Athens, Georgia, during Fiscal Year 1977 through the Surveillance and Analysis Division. However, this number is probably lower than what will actually occur, as unadvertised courses for personnel only within Region IV States are often held, as a consequence of certain needs arising. Advertised courses are offered to persons from any federal region.

Nationally, EPA has cut back on direct air pollution training offered to Regional, State and local personnel, and has instituted "user charges", or tuition, which have contributed to a decline in State and local participation. Some recipients complained that EPA courses offered too much theory and environmental principles and not enough practical material for personnel to apply to their everyday work. In an effort to resolve these problems, Region IV EPA officials have established and organized a training committee in which representatives from each Region IV State participate. The committee is called the "Southeastern Air Pollution Control Training Committee," or "SAPCTC".

The objective of SAPCTC is to assess the training needs of Region IV, to develop specific courses and curricula and make them available to State and local agencies at a minimal cost to EPA, to identify available training resources, and to improve the coordination and dissemination of training information for federal and non-federal training opportunities. If resources are available, SAPCTC will design and implement an instructor training and development program at the State and local level. Tuition is not charged to participants of SAPCTC courses.

The first SAPCTC course, "Control of Particulate and Gaseous Emissions",was held in Nashville, Tennessee, during October of 1976. The committee condensed two five-day courses offered by Research Triangle Park into four-and-one-half days, omitting much theory and focusing upon practical application. Fifty-five participants attended, representing each Region IV State. Assistance in training was also offered by representatives from each State. Federal committee coordinators considered this course a success, based upon State feedback, and planning is underway for a course to be offered relating to meteorology, diffusion and math modeling to be held in Mississippi in early spring. Subsequent training courses offered will be based upon needs identified by the Committee.

For future training the Air Pollution Training Institute at Research Triangle Park will continue to be called upon for courses to be offered in the Region. It is believed that these courses, together with what is offered by SAPCTC and the Surveillance and Analysis Division, air pollution personnel in Region IV will be able to maintain their level of knowledge needed in the performance of their duties.

D. Career Potential

Regional sources suggest that air pollution control programs within EPA Region IV will not require a significant increase in staffing levels.

Increases that do occur will probably include staffing presently allocated professional positions. With the foregoing in mind, then, a five to ten percent increase in the numbers of general environmental engineers and air resource planners may be a reasonable estimate of the divisional staffing configuration over the next five years.

E. Conclusion

Strategy planning for non-attainment areas is a new and developing program at this time. Additionally, energies are expected to turn more toward the transportation problem in the near future. However, the basic core programs are already in existence, as is the basic core staff. Slight increases in staff numbers may occur, but the expertise required for new programs will be met by upgrading employees already on line with existent training programs.

The Regional office has organized a regional training committee to assess State training needs. As a result, courses to regulatory personnel are being offered by the Committee. Air program administrators at Region IV EPA believe that these offerings, along with other EPA-offered opportunities, will supply the training required within the Region.

II. NOISE

A. Workforce Profile

Noise control and abatement activities in EPA Region IV take place within the Residuals Management Branch of the Air and Hazardous Materials Division. The Noise Control and Abatement Coordinator who is an environmental engineer, and a mechanical engineer are solely responsible for all related operations at this time.

These two persons are responsible for carrying out the mandates of the Noise Control Act of 1972 in Region IV. This is accomplished by providing technical assistance to Federal, State, local and regional environmental and occupational health agencies in the development and implementation of noise control programs and legislation. In addition, the Branch carries out a public relations effort by responding to citizen noise complaints, and giving testimony before State and local governmental bodies. Other Branch responsibilities include evaluating Environmental Impact Statements for compliance with noise regulations, and conducting noise surveys as may be needed. Pilot noise monitoring is conducted to support the Standards and Regulations Division at Headquarters EPA.

B. Workforce Projections

An engineer may be added to the Noise Abatement and Control staff in Fiscal Year 1977. The addition of a person for enforcement duties may also be possible within the next year or two, as new product regulations are forthcoming. A professional with a science or engineering background would be sought for this position. Legal assistance will be provided through the Enforcement Division.

Additional staff personnel would allow for an expansion of the technical assistance program, the future of which is currently being debated nationally. If implemented, the expansion would provide for implementation of a two-year comprehensive noise abatement program in a single community. This program would include "before" and "after" environmental surveys and assessments, the writing of ordinances and the establishment of effective enforcement and community education programs. Ten additional communities which have existing ordinances in functional areas such as construction noise, boundary line provisions for noise emission, land use planning and highway noise would be phased into the initial study. One functional area per community would be chosen to implement and evaluate a specific noise control area.

The additional staff would also allow for a concentration on the airport noise abatement planning process by assisting airports and communities in the development of noise abatement plans and their implementation. These people would also take part in the ongoing activities of monitoring, complaint response, general technical assistance, and the review of Environmental Impact Statements.

According to best professional estimates, it appears that this staff of four would be adequate to carry out needed programs and the mandates of the Noise Control Act, although a possibility exists that at some future date, a need may arise for a grants coordinator.

C. Training and Certification

The Noise Control and Abatement Coordinator takes part in the Executive Development Program that is offered to managers within EPA. The addition of personnel would require some type of on-the-job training to be available to new employees. This would probably be provided on an informal one-to-one basis with the Coordinator, and formal courses will be utilized, if needed. These are available through colleges and universities, and through instrument manufacturers.

Colleges and universities do offer a significant number of courses related to noise control that could be utilized by persons working in the field. However, in general it is felt that much of this effort is unnecessary, as so few opportunities exist in the field of noise control and abatement.

D. Career Potential

No new unique careers are expected to emerge within the Noise Control and Abatement Program within the next five years. Professions represented will continue to be in highly trained areas, with backgrounds of science and engineering dominating.

E. Conclusion

The limited expansion that is projected within the field of noise abatement and control is due in part to the fact that the effects of noise are not visible to the public as they are in other pollution control areas; hence, public concern is not as great. In addition, a high degree of resistance to regulations is taking place, and enforcement is not taking place at a high level.

New product regulations are forthcoming which will require stepped up enforcement activities at the Regional level. The future of technical assistance activities will be determined during a meeting on national strategy in the near future. All in all, the future of noise programs is difficult to predict, but dramatic growth is not expected.

III. PESTICIDES

A. Workforce Profile

The Pesticides Branch of the Air and Hazardous Materials Division of Region IV EPA coordinates and directs program operations within the region under the purview of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended. The regional program is administered by three sections: two Area Compliance Sections and a Program Support and Evaluation Section.

Each Area Compliance Section within its area is responsible for pesticide establishment inspections, collection of official pesticide samples for laboratory analysis and label review, Stop Sales and Recall Actions on products that are in violation of the Act, and surveillance of pesticide products imported or proposed for importation into the country. Surveillance of products under experimental use is also conducted to assure compliance with the experimental permit, as well as the reporting and investigation of incidents involving pesticides. These Sections also monitor and assist agencies that secure exemptions under Section 18 of the Act, and register and report production of pesticide-producing establishments under Section 7 of the Act.

The Program Support and Evaluation Section develops and maintains high-level contacts with State, Federal, and industrial representatives, assisting them in meeting the requirements of FIFRA through grants, contracts and technical assistance. These are designed to upgrade agencies in such areas as legislation, pesticide applicator and certification programs, disposal of excess pesticides and pesticide containers, and other areas involved with the use and registration of pesticides. Additionally, this Section develops and conducts seminars and workshops for other regulatory agencies and industry groups, and reviews and comments on appropriate Environmental Impact Statements.

Although the definition of "integrated pest management" differs to a large extent among persons in the field, Region IV's Pesticides Branch feels that this term means using any means possible to prevent and control pests. Pests can be weeds or grasses, and they can be insects. While to many, integrated pest management means total discontinuance of the use of pesticides, the Branch emphasizes reduction of use, and the encouragement of other means of pest control. All possible alternatives must be explored, based upon surveys of pests in the field, and thresholds for pesticide needs must be determined. Under this definition, the Branch has always been involved in integrated pest management, and will continue to be in the future.

The Pesticide Products Analysis Section, which is a part of the laboratory Services Branch of the Surveillance and Analysis Division, is located at Bay St. Louis, Mississippi. This Section is responsible for providing chemical laboratory support for the pesticide programs in Regions IV and VI by supporting regional program needs for chemical and physical analysis of samples and identification of contaminants. Limited training is also provided to State chemists.

EPA's Recommended Fiscal Year 1978 Intermedia Priority List reflects a commitment to pesticide pollution control. A second priority national objective is "to encourage the proper formulation, use and application of pesticides by enforcing registration and labeling requirements and providing technical and educational assistance". In addition, to "ensure that every State has an adequate program to certify applicators and to register pesticides for special local needs and encourage States to cooperate with the enforcement of FIFRA" is a third priority objective.

The following table represents the current pesticides workforce levels at the Region IV EPA offices:

TABLE IV
CURRENT (1976) PESTICIDES
STAFFING LEVEL

Air and Hazardous Materials Division, Pesticide Branch

Position	1976
Scientist	12
Technician	1
Staffed Positions in Regional-Federal Offices	7
(1) Other	6
Total	26

Surveillance and Analysis Division
Pesticides Products Analysis Section

Position	1976
Scientist	6
Technician	1
(1) Other	1
Total	8

(1) Clerical

In the Pesticides Branch, the positions located within the federal field offices are largely the same as those listed in the category of "scientist". These people are described as "Consumer Safety Officers", the requirements for which are at least a bachelor's degree in the biological, environmental or agricultural field. Several of these persons have more advanced degrees in such areas as entomology and zoology. All scientists in the Pesticide Product Analysis Section are chemists.

B. Workforce Projections

EPA administrators predict that EPA's new Toxic Substances Program, resulting from the Toxic Substance Control Act of 1976, will be included within the Pesticides Branch. The Branch would be renamed the "Pesticides and Toxic Substance Control Branch", and the workforce would necessarily increase. Pesticides programs will be dealt with in this Section, while plans for the toxic substances program will be described in the Conclusion. Administrators feel that locating the new toxic substances unit within the pesticides program is a logical action, since the only difference between a pesticide and toxic substances is the intent for usage.

Functions regarding pesticide registration will be delegated to the Regions, which should cause a personnel increase by Fiscal Year 1978. Other more gradual increases in pesticides programs such as in field inspection, accident investigation, and clerical support are also expected to occur. Firms must be inspected that produce and use pesticides to determine what substances are currently in use, the total amount of usage, and the total amount produced. Over 1,400 pesticide manufacturing firms are present within Region IV, with only eight people to conduct inspections. With the addition of the toxic substances program, an even greater number of firms will require inspection. With present staffing levels, only 250 inspections can be performed each year, and at this rate, six years are required to visit every pesticides production firm.

The following table depicts the workforce growth projected to take place in pesticides, according to estimates of professionals in the field. Figures from the Pesticides Branch and the Pesticide Product Analysis Section have been combined, and figures may be low in terms of reflecting actual needs, but are felt to be the most realistic.

TABLE V

WORKFORCE PROJECTIONS TO 1982 (est.)

PESTICIDE POLLUTION CONTROL

	1976	1977	1978	1979	1980	1981	% Average Per Annum Growth/Decline
Scientist	25	26	28	29	31	33	6%
Technician	2	3	5	6	7	7	31%
Other	7	7	8	9	9	10	8%
TOTAL	34	36	41	44	47	50	8%

Increases in the number of scientists reflect both those projected for the Pesticides Branch and Pesticides Products Analysis Section. An overall twenty-five percent increase in Consumer Safety officers is projected for the former unit for work in areas mentioned above. A total of three additional chemists is projected for the latter unit to keep up with the increased numbers of samples collected through field investigations. Two technicians are also projected to be added to the Pesticide Product Analysis Section for sample analysis. The remainder of the total projected increase in technicians is accounted for by the expected addition of persons to work in the Pesticides Branch for registration. These people will have had administrative experience, with no degree required. Overall, although turnover has been almost nonexistent, according to best professional judgments, new programs and expansion of existing pesticides programs in Region IV should require considerable numbers of new personnel, approximately an eight percent increase annually.

C. Training and Certification

All new entrants to pesticide programs receive informal on-the-job training. In the Compliance Section of the Pesticides Branch, this type of training is more structured, wherein a new entrant spends one to two years assigned to a field inspector and returns to Atlanta for short training sessions for learning the laws, regulations, and procedures. In addition, two Branch conferences are held each year to bring employees up-to-date on current issues and activities. Because of a lack of funds, this may,of necessity,be reduced to once per year.

Management and clerical courses are available to any employee through the Civil Service Commission. Technical upgrade training for personnel is available to some extent through such groups as the Federal Aviation Administration, the Food and Drug Administration and the Association of Federal Investigators. Also, a Federal training school for investigators exists near Washington, D.C.,which could be valuable for the Pesticides Branch Personnel for keeping up-to-date on investigative techniques and procedures. However, because of lack of funds, these resources can only be utilized to a very limited extent.

Training offered by the Pesticides Branch takes several forms. The Branch assists the State lead agencies and the Cooperative Extension Services in their own training by making presentations at conferences and seminars. The same cooperation exists with other Federal agencies, such as the Department of Agriculture, the Food and Drug Administration, and the Federal Aviation Administration, whereby the Pesticides Branch is "on call" through cooperative agreements to assist these agencies when needed.

Direct training to State regulatory agencies takes place when States receive their Federal training grants under the Act. Classroom and field training is then conducted by the Branch with appropriate State personnel, regarding inspection activities. Although the length of training depends upon the status and needs of each State program, classroom and field training could each vary from three days to one week. The Pesticide Product

Analysis Laboratory at Bay St. Louis is able to provide limited training to State chemists. However, to ensure that States are able to implement suggested procedures, techniques should be demonstrated with the use of State equipment, and again, the lack of travel funds prevents the provision of widespread on-site assistance.

Other EPA technical training in Region IV has largely been curtailed. The Perrine Laboratory in Florida which once trained laboratory technicians for State and Federal agencies has been closed, as has been the training center at Chamblee, Georgia, which trained inspectors and State pesticide project officers. However, limited pesticides training as it relates to air quality control is still conducted at Research Triangle Park, North Carolina.

The greatest training need is felt to be for State Laboratory personnel to be taught methods of analysis that are consistent with EPA practices and policies. The State pesticides enforcement program could be drastically downgraded by this current lack of laboratory training as the majority of the law violations must be determined through chemical laboratory procedures.

D. Career Potential

Persons with backgrounds in agricultural and natural science fields will continue to predominate within the Pesticides Branch. With the possible addition of toxic substances control activities, the same types of persons would be sought, with additional emphasis placed on backgrounds and knowledge in chemistry. Non-degreed persons will be sought when functions are delegated to the Regions for pesticide registration duties, although administrative experience will be required. Finally, increases in field enforcement will require growth in laboratory services. In the Pesticides Product Analysis

Section, analyses will continue to be performed by chemists and laboratory technicians.

E. Conclusion

Continual growth is expected within the pesticides programs of EPA Region IV as a result of increased activities as prescribed under the Federal Insecticide, Fungicide and Rodenticide Act, as amended. The new Toxic Substances Control Act of 1976 may greatly increase the staffing levels and scope of activities if the unit is placed within the Pesticides Branch. Additional information concerning toxic substances control plans are described in the Conclusion of this report.

The lack of proper training has been and continues to be a significant problem for federal pesticides personnel, and a deterrent to full program implementation. It appears that this overall need for training will be felt more acutely as new personnel are added, and as additional programs are implemented.

IV. POTABLE WATER

A. Workforce Profile

The Water Supply Branch of EPA Region IV Water Division administers the Interstate Carrier Water Supply (ICWS) certification program, and is responsible for implementation of the Safe Drinking Water Act. Concerning the first program, which provides for the regulation of those drinking water sources having interstate significance, specific activities include maintaining an ICWS register, eliciting timely reports for these supplies in accordance with EPA guidelines and standards, making surveys of deficient or questionable systems, and recommending appropriate ICWS classification to the Regional Administrator for formal EPA certification.

A principal goal of the Water Supply Branch in the implementation of the Safe Drinking Water Act is to aid the States to improve drinking water programs through technical assistance, training of personnel, and grant support. A loan guarantee is provided to assist small water systems in meeting regulations if other means of financing cannot reasonably be found. States must have adequate resources and workforce, and legislation at least as stringent as the federal legislation to achieve primacy, or become responsible for the implementation of their own programs under the Act. Water supply programs must be instituted in every State, and if States fail to acieve primacy, EPA becomes responsible for implementation.

The Safe Drinking Water Act provides for the protection of underground sources of drinking water by means of a regulatory program similar to that governing public water systems. Regulations are currently being promulgated by EPA, and certain States will be designated for program implementation. The same situation exists, whereby States must establish regulations at least as strict as federal ones in order to achieve primacy.

In terms of workforce, sixteen persons in EPA Region IV are charged to the Water Supply program, thirteen of whom are located within the Water Supply Branch itself. This is nearly double the amount of staff before the passage of the Act. Two persons in the Surveillance and Analysis Lab participate in Water Supply activities, as well as one person in another Branch of the Water Division.

The Water Supply Branch receives additional assistance from, and works in conjuction with other Branches of the Water Division when needed, particcularly from the Technical Support Branch. Within this Branch, cooperation comes mainly from the Hydro-Geology Analysis Unit and the Operations and Maintenance Unit. The Program Support Branch also plays a role in the administration of the Water Supply Program.

Positions delegated to Water Supply in Fiscal Year 1976 appear as follows:

TABLE VI
CURRENT (1976) REGION IV POTABLE WATER
STAFFING LEVEL

Position	1976
Engineer	
Sanitary	5
Environmental	2
Civil	2
Scientist	3
Technician	1
Clerical	3
TOTAL	16

B. Workforce Projections

One of the First Priority National objectives of EPA is to "continue to assist states in achieving primary enforcement responsibility for water supply management programs leading to the attainment of the National Drinking Water Standards". To achieve this objective, it is projected that additional personnel will be needed in the Water Supply Branch.

Fiscal Year 1977 will see the addition of six new positions to the Water Supply Branch. A Flouridation Engineer will be provided through an Interagency Agreement with the Center for Disease Control. Through an EPA reorganization plan, not yet implemented, the Technical Support Branch of the Water Division will be reorganized, and a hydro-geologist and a geologist from the Hydro-Geology Unit of that Branch will be transferred into the Water Supply Branch. Other planned Fiscal Year 1977 positions include a ground water engineer, a toxicologist and a clerk typist.

Turnover, except for clerical positions, has been practically nil within the past 5 to 10 years. Five-year projections are depicted in the following table.

TABLE VII

POTABLE WATER

WORKFORCE PROJECTIONS TO 1982 (est.)

Position	1976	1977	1978	1979	1980	1981	%/annum growth/decline (average)
Engineer	9	11	13	15	17	18	15%
Scientist	3	6	8	10	11	12	35%
Technician	1	1	2	3	4	4	37%
Other	3	4	4	5	5	6	16%
TOTAL	16	22	27	33	37	40	21%

Projections for years following 1977 include 8 hydrologists, geologists and engineers for the implementation of the Underground Injection Program. Eight additional positions, consisting of engineer, technicians and clerical support are projected for the Water Supply Program, for continued assistance to States for accepting primacy. A chemist and a technician are expected to be added to the Surveillance and Analysis Laboratory for Water Supply activities. Barring unforeseen circumstances, the increase will probably be gradual after 1977. It must be noted that all projections are based upon the assumption that all of the States within the Region will accept primacy, as is anticipated. Failure of States to do so would cause much greater staff increases at the Regional level.

Although little involvement with Water Supply is presently taking place within the Enforcement Division, activity is expected to increase, and this Division will carry out the enforceable parts of the Act. It is projected that the Enforcement Division as a whole will grow at an annual rate of five to seven percent, as it has in recent years.

C. Training and Certification

A Water Supply Training Plan has been developed for new employees, and is being implemented by the Water Supply Branch. It is designed to present an orientation and background regarding the Water Supply Branch, and to provide specific information regarding the evaluation of public water supplies. The sessions are scheduled for three afternoons each week, with flexibility allowed, and are taught by senior staff persons. Scheduled to last five to six months, the sessions include films, slide-tape presentations, field trips and discussions. For new entrants to become well acquainted with the Regulations of the Act is a primary goal of the training process.

Upgrade training within the Water Supply Branch consists of the attendance of each person in either an EPA or a Civil Service commission course. Since direct Potable Water training has essentially been discontinued by EPA, professional staff persons are encouraged to attend at least one professional meeting per year as a substitute. Courses and conferences of the American Water Works Association are attended regularly and utilized for upgrade purposes.

Training to State and local Water Supply personnel by the Branch has taken the form of technical assistance on a one-to-one basis, due to federal policy limitations. This type of assistance has proven effective in upgrading the skills, but the number of persons assisted annually is limited. To enhance the skills of State and local personnel, and to reach the greatest number of people possible, based upon the amount of funds available, EPA Headquarters, in cooperation with the Regional Offices, is developing training plans and programs.

Because of the difficulty in arranging direct training, most efforts proposed for this national program will be in the area of curriculum development. EPA Headquarters will award grants for courses to be packaged, and the direct training for the most part will come from State regulatory agencies, junior colleges, State Operator Associations, or whoever is willing to put the materials to use. In many cases, States will be able to fit these courses into existing programs.

Water Supply training plans are much farther advanced than are those for Underground Injection. Current Water Supply training plans include the following:

1) Grants will be awarded to the American Water Works Association to develop a series of manuals for local officials, and to develop a basic operator training course.

2) A grant will be awarded to the Conference of State Sanitary Engineers to collate all existing training materials.

3) The EPA National Training Center will develop a short course on laboratory certification. Short courses will also be developed on bacteriological methods, organic chemical analysis, inorganic chemical analysis, and chlorine residuals.

Package courses on Public Notification and Variances and Exemptions are planned, and a program for helping State Training Program Managers is also anticipated. An agreement with the U.S. Office of Education is planned, for the stimulation of Water Supply training through State vocational education systems. Finally, a project will exist involving State rural water associations for training to be provided to small systems funded by the Farmer's Home Administration. All of the above-mentioned plans should be underway by the latter part of Fiscal Year 1977.

One-half million dollars has been transferred from EPA to the U.S. Office of Education, Bureau of Adult Education, for the development of water supply operator training programs in one or two States in each Region. Region IV has been allotted $81,500, and the Regional EPA and Office of Education will jointly decide which State(s) will receive the funds, based upon need and current training availability. Occupational and technical training will be provided by the State vocational education system(s), and upgrade-type training will be the chief focus. EPA will provide training materials through the previously mentioned developmental grants, and implementation will not take place at least until June of 1977.

Longer range plans for Water Supply training are more in the line of direct conferences and seminars for EPA and State regulatory personnel. Emphasis will be based on administrative issues such as planning, grants administration, budgeting, and reporting.

Underground Injection Control training plans are in their early stages, but will be geared mainly towards equipping Federal and State people with the tools they need to run their programs administratively, and to some extent, technically. Tentative plans include a national week-long conference for EPA professionals regarding technical and administrative aspects of the program, and a national conference to advise State legislators of the implications of the Underground Injection Control Program.

D. Career Potential

It is projected that by 1982, sanitary and environmental engineers will still dominate Water Supply staffing levels, although a need for several additional technicians is anticipated. Preference for new employees would be shown to those with public health/water supply experience. Increased emphasis in toxic substances control in potable water will require a toxicologist and several laboratory personnel.

Implementation of the Underground Injection Control Programs will call for increased numbers of scientists and engineers. Since this program is so recent and undeveloped nationally, persons with knowledge of underground injection are scarce, and those with this type of knowledge will be in demand, both at the State and Federal level.

E. Conclusion

Growth has been rapid within the EPA Region IV Water Supply Program in recent years, and growth is expected to continue, but at a lower rate. Assuming that all States accept primacy by Fiscal Year 1979, the Regional function will then stabilize to one of providing technical assistance and problems of variances and exemptions. Fiscal Years 1977 and 1978 will require that Region

IV maintain a very close relationship with the State organizations to establish these capacities at the State level.

The Underground Injection program is in much earlier stages than the Water Supply program. After regulations are promulgated, States will be designated for the required establishment of programs. This, too will require close cooperation in the provision of technical assistance to the State agencies for developing their capacity to accept primacy.

The lack of training available at Federal, State and local level has proven to be a problem, as new regulations are promulgated which require new procedures, new and more sophisticated analyses, and previously unrequired areas of expertise. A training plan developed by EPA Office of Water Supply in Washington, D.C., is designed to meet the needs of State, local and to some extent, Federal officials in meeting the mandates of the Act, both with regard to Water Supply and Underground Injection.

V. RADIATION

A. Workforce Profile

The Environmental Radiation Section is housed in the Residuals Management Branch of the Air and Hazardous Materials Division, and is concerned with all environmental radiation sources, and any adverse impacts they may have on the environment. The major radiation sources they are concerned with include nuclear power plants (planned, under construction, or operating), Naval bases, burial grounds for low level radioactive wastes, and fuel fabrication plants.

Technical assistance is provided to State environmental radiation programs through the development and implementation of comprehensive and integrated environmental radiation protection activities. They also provide the States with information concerning the scope and impact of regional environmental radiation problems, and, in conjunction with other organizations (both governmental and non-governmental), plan projects to solve problems.

Activities of the Environmental Radiation Section fall under the purview of several pieces of legislation and mandates. Programs and their authorities are as follows:

Program	Authority
1. Environmental Impact Statement Review	National Environmental Policy Act
2. Drinking Water Regulations for Radiation	Safe Drinking Water Act
3. NPDES Permits	Federal Water Pollution Control Act
4. State Emergency Response Planning	Federal Register 12/24/75
5. Natural Radioactivity	Public Health Services Act

Currently, four persons are employed in the Environmental Radiation Section. This group consists of a health physicist, a nuclear engineer, a bio-physicist, and a secretary.

B. Workforce Projections

The addition of a person with a background in the general area of health physics, preferably with a master's degree, is possible in Fiscal Year 1977 within the Environmental Radiation Section. In Fiscal Year 1978, a radiochemist and a technician are expected to be added to the Laboratory Services Branch of the Surveillance and Analysis Division for monitoring, technical assistance and laboratory evaluation in regard to radiation. Beyond this Fiscal Year, several additional professionals in health physics and nuclear engineering will be added to the Environmental Radiation Section. Limited activity in Radiation Control has taken place within the Enforcement Division, and little increase in activities in this area is expected, since much of this type of activity is handled by the Nuclear Regulatory Commission.

Projections of staffing levels for radiation control are based upon professional judgment within the Environmental Radiation Section, and are depicted as follows:

TABLE VIII
WORKFORCE PROJECTIONS TO 1982 (est.)
RADIATION CONTROL

	1976	1977	1978	1979	1980	1981	% Average Per Annum Growth
Engineer	1	1	1	2	2	2	20%
Scientist	2	3	4	4	5	5	22%
Technician	0	0	1	1	1	1	N/A
TOTAL	3	4	6	7	8	8	23%

A major reason for increased staffing needs relates to the fact that Region IV is very heavily impacted with nuclear facilities and disposal sites. Twenty-five percent of the announced nuclear generating plants for the United States will be in Region IV. Two of the three enrichment plants are in this Region, as well as the nation's only reprocessing plant. Capability is also needed for increased emphasis and control in the area of natural radioactivity and for assistance in the development of State Emergency Response Plans. The Drinking Water Radiation Standards will be implemented, States will be achieving primacy within two years, and will need additional technical assistance from EPA.

C. Training and Certification

With turnover having been almost nil in recent years, on-the-job training within the Section has not been required. New entrants will preferably have had a considerable amount of previous experience, but if not, on-the-job training will be utilized. This would consist of a mixture of formal and informal training.

Upgrade training for personnel has been limited to Civil Service Commission management courses, due to a lack of resources. Needs for available technical upgrade training and the resources required will become more acute as new persons are added to the staff. Colleges and universities are beginning to fill in the void for radiation training, but neither EPA nor the States have the resources to be able to take advantage of the courses offered.

A Regional Training committee has been established, at the suggestion of EPA Headquarters to help in meeting State training needs.

Headquarters and Region IV personnel participate, as do State Radiation Directors and the Food and Drug Administration. Symposia are held two or three times a year at which training voids are determined and plans of action are discussed and implemented. Outgrowths of these symposia are courses to be offered to state regulatory personnel. One or two courses per year will be offered at various locations, each lasting one to two weeks. Personnel from within Region IV boundaries will receive priority, but other regions may also be represented.

The first of these courses will be offered in December, 1976, at the University of Florida and will pertain to environmental monitoring and surveillance. Subsequent courses offered will all be designed to meet determined training priorities.

D. Career Potential

With one exception, future positions within Environmental Radiation Control programs at EPA Region IV are expected to remain at high professional levels. Additional staff members are expected to consist of nuclear engineers, a radiochemist, a laboratory technician and persons with backgrounds in the area of health physics. For all positions, persons with previous experience will be sought, and masters degreed persons will receive priority for professional positions.

Because no new legislation is impending regarding radiation control, no new careers in the field are expected to emerge. It is felt that much potential does exist, however, especially in the field of natural radioactivity.

E. Conclusion

Radiation control workforce levels are very low compared with those of other pollution control areas. Although increases are expected, no new legislation is impending, and staffing levels will probably remain relatively low. Efforts will be directed toward gearing up for and continued implementation of existing programs. Chief activities will include Environmental Impact Statement review and technical assistance to states regarding Emergency Response Plans and Drinking Water Regulations.

Continuing problems experienced within the Environmental Radiation Section include a shortage of personnel and inadequate training. To ease the latter problem, a Regional Training Committee has been formed which consists of State and Federal representatives. Training voids will be defined and programs will be carried out to meet these needs. Universities are offering needed radiation courses, but neither the federal nor the state people have the resources to allow personnel to attend.

VI. SOLID WASTE

A. Workforce Profile

The Solid Waste Management and Land Protection Section is a part of the Residuals Management Branch of the Air and Hazardous Materials Division. In Fiscal Year 1976, functions have included providing technical assistance to Federal facilities and agencies, State agencies, private agencies and organizations, industrial groups, institutions, multigovernmental authorities, municipalities, counties, and individuals in all aspects of hazardous and solid waste management planning, engineering design, and operation and maintenance. This technical assistance is available in the areas of energy and material recovery and reuse, municipal and instituional solid waste source reduction, collection, storage, processing and ultimate disposal.

The Section assists the Regional office of Federal Facilities as requested to assure compliance with guidelines developed under the Solid Waste Management Act, and the 1972 Federal Water Pollution Control Act, as amended. State and local agencies are assisted by grants processed through this branch under the authority of the Solid Waste Disposal Act, as amended.

The recent passage of the Resource Conservation and Recovery Act of 1976 will require additional activity within the Solid Waste Management and Land Protection Section. Technical assistance will be stepped up for the State and local level, and additional assistance will be required for Federal facilities to meet the guidelines of the Act. Lists of hazardous waste disposal sites must be developed, and types of wastes must be identified, as well as current methods of disposal. Resource recovery sites and land disposal sites must also be inventoried.

Federal facilities will become demonstration areas for reducing the amount of waste generated, and in the implementation of resource recovery activities. Effective methods will be applied to other governmental agencies and in the private sector. This will require assistance from the Section for these facilities. This type of assistance will also be provided to industries.

A hazardous waste permitting program will be implemented under Subtitle C of the Act and the States will have the opportunity to administer their own programs after having demonstrated the capability to do so. Technical assistance will be required from the Section, and if States fail to accept primacy, EPA will be responsible for entire program implementation.

Likewise, under Subtitle D of the Act, States will develop State Plans. The Plans will prohibit establishment of new open dumps, will close or upgrade all existing open dumps, and will provide for resource conservation or recovery and for the disposal of discarded materials in a sanitary landfill. Technical assistance will be provided by the Section to the States for the development of the Plans..

The current (1976) staff of the Solid Waste Management and Land Protection Section consists of an environmental engineer, who serves a dual capacity as chief of the Section and as chief of the Residuals Management Branch, two sanitary engineers, a chemical engineer, and an environmental protection specialist. Two persons have left the Section in the last two years, one by transfer within EPA.

B. Workforce Projections

Additional personnel needs have been projected within the Section for implementation of the new Act. Increased staffing levels that result from the

Act will probably occur by Fiscal Year 1979, as an eighteen-month time limit has been set by Congress for implementation. Based upon Congressional appropriations, numbers of new positions are projected as follows by Region IV administrators, by Subtitle of the Act:

Subtitle/Functions	Positions Required (in person-years)		
	FY 77	FY 78	FY 79
Subtitle B:			
1. Resource Recovery Panels	4.0	4.0	4.0
2. Grants on Tire Shredders	0.2	0.2	0.2
Subtitle C:			
1. Development, Promotion, Negotiations and Grant-making and Monitoring Program for Hazardous Waste Permit Program	4.0	6.0	8.0
2. Notification Notice Required by Law-Hazardous Waste Permit Issuance	0.0	4.0	6.0
3. Compliance	0.0	0.0	0.0
Subtitle D:			
1. State Planning a. Inventory b. Identification of Regional Planning Authorities and Regions	4.0	6.0	6.0
2. State and Local Implementation Grants	1.4	2.4	2.4
3. Special Community Grants	0.2	0.2	0.2
4. Rural Assistance Grants	1.0	1.0	1.0
Subtitle F:			
1. Federal Liaison for State Permits and Guidelines Compliance and Technical Assistance	1.0	2.0	2.0
Subtitle G:			
1. Grants for Training and Education	0.2	0.2	0.2
TOTAL:	16.0	26.0	30.0

Needs and allotted positions could vary from the above estimates, due to several factors. Although Congressional appropriations have been defined, authorizations could be lower, depending upon decisions and actions at Headquarters EPA and the Office of Management and Budget. Regional enforcement requirements may also be greater if this responsibility is charged to Regional offices rather than Headquarters. Finally, staffing needs could vary according to the initiative of the States in developing and implementing their own programs.

New positions will include chemical and sanitary engineers, environmental specialists and clerical employees. A grants coordinator will also be required. Specialists will require experience in the field, preferably with degrees in biology or other science-related field. Engineers with experience in the field are much more difficult to recruit, although they would be preferred.

The following table depicts approximations of future workforce levels, by profession, based upon information provided by the Solid Waste and Land Protection Section:

TABLE IX
WORKFORCE PROJECTIONS TO 1982 (est.)
SOLID WASTE (HAZARDOUS MATERIALS)

	1976	1977	1978	1979	1980	1981	% Average Per Annum Growth/Decline
Engineer	4	8	14	16	16	16	38%
Scientist	1	5	8	9	9	9	95%
Other	0	3	4	5	5	5	15%
TOTAL	5	16	26	30	30	30	60%

C. Training and Certification

On-the-job training for new entrants takes place on an informal basis, whereby new staff members are oriented and supervised by an experienced person. Upgrade training is available for EPA, the Civil Service Commission, and from professional association meetings. Civil Service courses, which are basically in the area of management skills, are the main source of formal training utilized within the Section. A great need exists for professional training in technical areas, as would be supplied through EPA courses or association meetings, but staff members are rarely able to attend because of low travel budgets. This is felt to be a problem because the staff must be kept up-to-date on technology, research and development efforts and federal policy and activities to provide States with needed technical assistance. Until recent years, the Solid Waste Training Academy of EPA's Office of Research and Development presented package courses throughout the country in the field of solid waste for Federal, State and local personnel. During one year, the Academy provided training to over 600 persons in Region IV. The Academy was abolished several years ago, in part because of a decreased emphasis at EPA Headquarters on training, according to Regional officials. As a result, training responsibilities have shifted to the Regional offices.

Until recently, Region IV training activities for States have taken the form of one-on-one technical assistance. In 1976, the Southeast Solid Waste Training Committee was established by the Section for critiquing training needs and for providing the type of training that may be needed. This committee is made up of the State Solid Waste Directors and the Solid Waste Management and Land Protection Section. Input from Headquarters is also provided when needed. Training courses will be offered, the first of which was offered in October, 1976, in Atlanta on "Elements of Solid Waste Management". Approximately 50 persons attended from Region IV States, and EPA officials consider the course a success. Future courses will be more indepth, the contents of which will be based upon State recommendations, and one will be held in each State over a four-year period.

Although university training in the whole solid waste field has largely been dropped because of the small job market, it is felt that with the advent of the new Act, schools may re-offer courses that could be utilized by professionals in the field.

D. Career Potential

No new or unique careers are expected to emerge within the Solid Waste Management and Land Protection Section within the next five years, and engineers and specialists will continue to dominate. Mechanical engineers will probably be needed for resource recovery activities, chemical engineers will be utilized for hazardous wastes, and additional sanitary engineers will be required.

Specialists come from science backgrounds, but emphasis for recruitment will be placed on experience in the field. Specialists will be sought with experience in the fields of hazardous waste management, resource recovery, municipal waste management, and industrial wastes. For any new entrant, an economic and a legal background would be helpful.

E. Conclusion

As a result of the passage of the Resource Conservation and Recovery Act of 1976, staffing needs within the Solid Waste Management and Land Protection Section will increase significantly. Current projections allow for an increase from five to thirty positions by 1979. The exact magnitude of the staffing increase will become more apparent as implementation of the recently adopted Act commences. Those to be recruited will mainly be specialists with science backgrounds and experience in the field, and mechanical, chemical and sanitary engineers.

Technical assistance to States will assuredly be increased for assisting them in achieving capability to implement their own programs under the Act. EPA staff technical training, however, is not available at the level desired by the staff because of restrictive travel budgets. Plans for meeting state training needs are underway through the development of the Southeast Solid Waste Training Committee. This is felt to be a mechanism through which, if properly utilized, major state training needs could be met, at minimal expense to the participants.

VII. WASTE WATER

A. Workforce Profile

Activities regarding waste water and water quality control take place not only in the Water Division of Region IV EPA, but also in the Water Surveillance Branch and the Laboratory Services Branch of the Surveillance and Analysis Division, and in the Enforcement Division. Within the Water Division itself, many components and types of functions exist, the major portion of which fall under the purview of the Federal Water Pollution Control Act, as amended. The major objective, as stated in the Act, is to restore and maintain the chemical, physical, and biological integrity of the Nation's Waters.

The Facilities Operations Branches of the Water Division are the divisional focal points which interface with State and local agencies for all operating program activities. Broken into eight State sections, each unit conducts activities in the areas of planning, facility engineering, operation and maintenance, project management, and permitting Technical policy and expertise is provided to the Operations Branches through the Technical Support Branch of the same Division. This is provided through two Sections, the Applied Technology and Special Projects Sections.

The Program Support Branch of the Water Division functions as the administrative component of the Water Division. As such, the Branch plans, coordinates, evaluates and advises on all divisional activities relating to regional and State program planning and reporting, grants administration, and provides technical assistance on economic and financial matters relating to grant applications and awards.

Interagency activities are coordinated by the Interagency Liaison staff of the Water Division. While the main emphasis relates to the development of areawide Waste Treatment Management Plans, other activities are conducted in areas such as 1975 National Water Assessment and other Water Resources Council activities, National Water Quality Commission, National Studies and Regional Assessments, Coastal Zone Management activities, and Small Business Administration loan coordination and certification.

The Water Supply Branch is also located within the Water Division. While the Technical Support and Program Support Branches provide input into the Regional Water Supply program, the bulk of activities in all Branches excluding Water Supply centers around waste water and water quality control. The administrative arm of the Division oversees all of the Branches.

The Water Surveillance Branch of the Surveillance and Analysis Division is responsible for the planning and conduction of all water quality investigations, exclusive of those related to aquatic biology, within the Region. The Branch is also responsible for all aspects of ambient water quality monitoring and provides math modeling for the Surveillance and Analysis Division. The Laboratory Services Branch is responsible for and provides chemical and microbiological support to this Division, and supports regional program needs for chemical and physical analysis of samples and identification of pollutants.

Program policy and technical direction of the regional water enforcement activities is provided through the Water Enforcement Branch of the Enforcement Division. Region wide objectives and programs for water enforcement are developed, and violations of Federal water pollution control laws are determined. Activities are carried out by a Permits Section and a Compliance Section.

Region IV's commitment to water pollution control is evidenced in review of the Recommended Fiscal Year 1978 Intermedia Priority List, as illustrated by three of the five first-priority objectives. The second relates to the management of the Construction Grants program. The third priority is to assure compliance by major dischargers with NPDES permit compliance schedules, and the fifth is to provide assistance to State and areawide water quality management (208) agencies to assure adequate and timely performance in the development of the continuing water quality management process, with required attention on the area of non-point sources.

Current staffing levels in water pollution control appear in the following table:

TABLE X

CURRENT (1976) REGION IV WASTE WATER STAFFING LEVEL

Water Division (Excluding Water Supply Branch and Director's Office)

Position	1976
Engineer	
Sanitary	28
Environmental	44
Civil	5
Mechanical	1
Hydrologist	1
Geologist	1
(1) Scientist	10
Technician	5
Trainee/Aide	4
Temporary	5
Clerical	29
(2) Other	23
TOTAL	156

Surveillance and Analysis Division, Water Surveillance Branch

Position	1976
Engineer	
Sanitary	10
Electronic	1
Scientist	5
Technician	4
Clerical	3
(3) Other	1
TOTAL	24

Surveillance and Analysis Division, Laboratory Services Branch (estimated in person-years)

Position	1976
Scientist	10
Technician	2
TOTAL	12

Enforcement Division, Water Enforcement Branch

Position	1976
Engineer	
Sanitary	3
Environmental	14
Scientist	12
Technician	4
Trainee/Aide	3
Clerical	18
(4) Other	2
TOTAL	56

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(1) Includes environmentalists, environmental protection specialists, etc.

(2) Includes manpower specialists, grants specialists, planners, etc.

(3) Includes computer systems analyst

(4) Includes computer systems administrator, data management assistant

B. Workforce Projections

Turnover is generally low within water programs, averaging approximately five percent for professionals and three percent for clerical employees. These rates are attributed in part to competitive pay scales and attractive benefits, and to high chances for upward mobility within the system.

Increases in workforce levels are projected to occur within the next five years in each Region IV water quality program area. The following table depicts these increases, as forecasted by professionals. Previous numbers have been combined, and clerical, trainee and temporary employees are not included.

TABLE XI
WORKFORCE PROJECTIONS TO 1982 (est.)
WASTE WATER POLLUTION CONTROL

	1976	1977	1978	1979	1980	1981	% Average-per annum Growth/Decline
Engineer	106	109	112	115	117	119	2%
Scientist	39	45	49	53	55	57	8%
Technician	15	19	23	25	26	27	13%
Other	26	31	33	36	38	40	9%
TOTAL	186	204	217	229	236	243	6%

Increases in the number of engineers are projected within the Water Division itself for non-point source control and 208 program management, although to some extent, as engineers leave the staff, paraprofessionals such as engineering technicians and administrative aides will take their place. At least three additional geologists and the same number of toxicologists will be needed in the Division due to increased activity in the area of underground injection control. Increased numbers of planners and technicians will also be needed for 208 program management, as the Region must provide additional technical assistance to grantees to ensure acceptable plans by November 1, 1978. It is anticipated that other water-related planning needs beyond this date will require continuing increased numbers of planners. Finally, in the Water Division, an increased need for contract auditors is expected, as more stringent guidelines are developed for contractors because the federal share of funds is up to seventy-five percent of the total.

Within the Water Surveillance Branch of the Surveillance and Analysis Division, increased needs at all levels are projected for increased monitoring and field work in relation to toxicants, with the issuance of new regulations. A new duty of this Branch is the preparation of the Regional Water Quality Report, although this will probably be handled by existing personnel. A water quality computer system will be implemented ("STORET"), and computer technicians will probably be added to the Branch through interdivisional transfer. Also within the Surveillance and Analysis Division, two chemists and a technician are projected to be added to the laboratory component for increased responsibilities in the area of toxic substances.

A yearly five to seven percent increase in personnel in the Water Enforcement Division is projected. According to the Region's Five Year Plan, "EPA's workload in (NPDES) permit issuance has not eased as originally expected primarily because our overview takes more time than estimated because the program is becoming increasingly complicated". Some of these mentioned complications relate to the required incorporation of toxic substances into NPDES permits, ensuring compliance with industrial pretreatment standards and requirements, permitting for facility sludge disposal, and the review of various plans. In hazardous materials, regulations will result in a thirty to fifty percent increase in activity involving spill prevention and responses. Although additional services are offered to the water programs through the Legal Support Branch of this Division, an additional attorney will probably be needed for non-point source control activities, though not depicted in Table XI.

C. Training and Certification

Courses sponsored by the Civil Service Commission are available to nearly every EPA employee. Offerings include management and clerical type courses, including such areas as listening and memory development, bookkeeping and accounting, secretarial techniques, and office management. Technical water-related training is utilized by employees through the EPA Laboratory at Cincinnati, Ohio,and through courses offered through the Surveillance and Analysis Division of Region IV EPA. Selected professional employees may also be sponsored to attend graduate level courses offered by universities. The most commonly utilized schools are Georgia Institute of Technology and the University of Georgia.

Within the Water Division, an effort has been made to hire professional contractors to teach courses to EPA personnel. Past efforts in this type of activity have been considered highly productive, and will be continued as allowed by a relatively small amount of funds available for training purposes. Within the past year, two such courses were conducted, "Values Engineering", and one pertaining to construction grant activities. Those attending included Federal and State personnel, and private consulting engineers.

Direct training by the Surveillance and Analysis Division during Fiscal Year 1976 consisted of twenty-two training courses and nine workshops. Although courses relating to air pollution control, supervision and management, and project contracting were included, a good portion related directly to waste water pollution control. The following table depicts water pollution-related courses that were offered, the locations, lengths, and numbers trained.

TABLE XII

TRAINING COURSES SUPPORTED/CONDUCTED DURING FISCAL YEAR 1976
BY THE SURVEILLANCE AND ANALYSIS DIVISION

Course	Location	Length	Attendance
Wastewater Treatment Operations	Home Study	3 Months	11
Pesticide Residue Analysis in Water	Athens, Ga.	5 Days	13
Introduction to Instrumental Analysis of Water Pollutants	Athens, Ga.	5 Days	16
Troubleshooting O&M Problems in Municipal Wastewater Treatment Facilities	Athens, Ga.	5 Days	32
Fish Kill Investigation Technology	Athens, Ga.	3 Days	20
Stream Surveillance and Monitoring: Field and Lab Procedures	Athens, Ga.	5 Days	14
Surveillance and Monitoring of Estuaries	Skidaway Island	5 Days	29

In addition to these related courses, a workshop was conducted during the same fiscal year entitled "EPA Water-Waste Lab Evaluation Training". This workshop lasted three days, and forty-one persons attended.

Table XIII depicts related courses scheduled for Fiscal Year 1977 by this Division (six out of a total of ten planned). It should be noted that the number of courses that take place will actually be higher, as unadvertised courses are often offered to Region IV personnel when previously unanticipated needs arise.

TABLE XIII

TRAINING COURSES PLANNED FOR PRESENTATION DURING FISCAL YEAR 1977 BY THE SURVEILLANCE AND ANALYSIS DIVISION

Course	Length
Inspection of Wastewater Plants for Compliance Purposes	3 Days
Pesticide Residue Analysis in Water	5 Days
Introduction to Instrumental Analysis of Water Pollutants	5 Days
Troubleshooting O & M Problems at Municipal Wastewater Treatment Facilities	5 Days
Water Quality Pollutant Source Monitoring: Field and Laboratory Procedures	5 Days
Bacteriological Tests for Permits Compliance	5 Days

Although eighty-two percent of those attending the Division-sponsored courses are Region IV State personnel, EPA staff may also participate. Several upgrade training needs still exist for EPA water pollution control personnel, however. Specific needs exist in the areas of toxic substances and the planning requirements involved, and regarding new and unique waste treatment processes and procedures. Statements have been made by professionals, however, that additional staff technical training is needed in almost every area of program activity. Lack of available training funds is a prime roadblock.

Short courses for waste water personnel in each State are offered by the Water Surveillance Branch. These courses relate to ambient water sampling, flow monitoring and field activities regarding compliance monitoring.

Three States have received this training thus far, with a total of approximately eighty participants. The remainder of the States will be visited for this purpose before Fiscal Year 1977 is completed. Operations and Maintenance demonstrations are also provided to municipal plant personnel on an individual basis. All training-related activities within this Branch would be expanded if more funds were available.

D. Career Potential

Although engineers, according to projections, will remain the largest group in waste water programs during the next five years, new trends are appearing in staffing requirements as a result of new phase implementation of existing programs, and the start-up of new types of programs. Increased activities in the area of 208 program management will require more planners and, in the future, it is felt that more reliance will be placed upon this group for an increasing number of programs. Preference in hiring will be shown for those planners that have an understanding of engineering feasibility and laboratory activities.

Contract auditors will be required in increasing numbers for all grant activities prescribed under the Act. In addition, as trends towards computerization are emerging, specialists and technicians in this area will be required for permitting, enforcement and surveillance activities.

New areas of emphasis relate to groundwater, toxic substances, and radiation control. Additional scientists in the areas of toxicology, geology, chemistry and other related fields will be required as these programs achieve full implementation.

Current use of technicians would be greater were it not for Civil Service requirements. Under this system, engineering technicians are classified as draftsmen, who do not meet the needs. However, an adequate procedure is being utilized whereby qualified persons are hired as secretaries and upgraded to paraprofessional positions. Using this system, additional numbers of technicians will be hired, to some extent replacing engineers, through attrition.

E. Conclusion

To fulfill the objective of the Federal Water Pollution Control Act, EPA has been charged with the prime responsibility in carrying out the defined goals. These goals are:

1) The discharge of pollutants into navigable waters will be eliminated by 1985,

2) Water quality will be attained by 1983 which provides for the protection and propagation of fish, shellfish and wildlife, and provides for recreational uses,

3) The discharge of toxic pollutants in toxic amounts will be prohibited,

4) Federal financial assistance will be provided to construct publicly-owned waste treatment works,

5) Areawide waste treatment management planning processes will be developed and implemented, and

6) Major research and demonstration efforts will be made to develop the necessary technology for meeting the goals.

Since the passage of the Act, EPA has "geared-up" with the additional personnel necessary to carry out its responsibilities. Currently, staff personnel that work directly in water pollution control represent nearly half of all total Region IV EPA employees. Staffing levels, however, have not reached their peak, according to professional projections, due not only to increased resource needs for continued and upgraded maintenance of existing programs, but also due to the addition of new program functions mandated by the Act. As a result of projected changes, professional representations within the staffing structure should change somewhat. Engineers, although to be continually utilized, will to some extent be replaced by paraprofessionals, and increased needs will occur for geologists, toxicologists, planners, contract auditors and chemists.

Not only will increased staffing levels be required for full and effective implementation of the Act, but a great need exists for available staff training, especially with regard to those program areas that are essentially new. Additional resources must also be supplied for making Regional expertise available at the State and local levels.

VIII. ENERGY CONVERSION/CONSERVATION

Federal energy-related activities within Region IV take place in a number of agencies. In this section of the report, summaries of significant efforts within the Region are provided. Included is a background of the Energy Research and Development Administration and descriptions of three of its areas of involvement within the Region. In addition, information concerning the Regional Offices of the Nuclear Regulatory Commission, the Federal Energy Administration and the Federal Power Commission has been included.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

BACKGROUND

The Energy Reorganization Act of 1974 abolished the Atomic Energy Commission and created the Energy Research and Development Administration (ERDA) and the Nuclear Regulatory Commission (NRC). This federal realignment separated regulatory from developmental aspects of nuclear energy, and centralized the major energy research and development programs. The Federal Non-nuclear Energy Research and Development Act of 1974 further defined ERDA's role, directing the Administrator to design and construct a comprehensive national program of research and development of all potentially beneficial energy technologies, with particular emphasis on energy conservation, environmental protection, and availability of adequate water supplies.

A major task set forth for ERDA was the preparation of a national plan for energy research and development. As finalized in mid-1975, this plan set forth the following goals for energy research and development:(1)

1) To maintain the security and independence policy of the nation;
2) To maintain a strong and healthy economy, providing adequate employment opportunities and allowing fulfillment of economic aspirations;
3) To provide for future needs so that lifestyles remain a matter of choice and are not limited by the unavailability of energy;
4) To contribute to world stability through cooperative international efforts in the energy sphere;

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(1) Council on Environmental Quality, Environmental Quality, 1975 (Washington, D.C., U.S. Government Printing Office, 1975), p. 116.

5) To protect and improve the nation's environmental quality by ensuring that the preservation of land, water and air resources is given high priority.

The following pages describe active ongoing ERDA activities in the geographical boundaries of Federal Region IV. Information has been provided by professionals working within the ERDA offices.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Atlanta, Georgia

The Energy Research and Development Administration (ERDA) operates a regional office in Atlanta, Georgia. Two employees, both geologists, supervise and oversee the activities in this Region of an ERDA contractor, Bendix Field Engineering Corporation. The Corporation employs six geologists that work out of this ERDA office, the chief function of whom is to ascertain the uranium potential in the Southeastern United States. Preliminary geological studies are conducted, and technical reports are provided on a three-month basis. The area under study includes all of Georgia, Florida, North Carolina, South Carolina, and Tennessee, most of Alabama, and parts of Kentucky and Virginia.

A chief aim of ERDA in this Region is to keep abreast of industrial activities and to promote interest in and the exploration of areas known to be uranous. Also, interrelating with the U.S. Geological Survey and the E.I. duPont deNemours and Company Savannah River Laboratories at Aiken, South Carolina, ERDA conducts the National Uranium Resources Evaluation Program. A Hydro-geochemical and Stream Sediment Reconnaissance Survey is also conducted.

Although no growth in the number of ERDA employees is expected in the next five years, the number of Bendix non-clerical contracting employees is expected to increase to a total of ten within the next two years. This will probably include nine geologists and one technician. After this point, no additional growth is expected as the workload is expected to stabilize. Future activities are expected to remain in the area of the development of uranium potentials. The five-year term of the Bendix contract will terminate in mid-1977, although a renewal is expected.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
Aiken, South Carolina

The Energy Research and Development Administration (ERDA), in creating a program of nuclear production and research, chose the Savannah River as the site of a key installation. This project center between Aiken, South Carolina and Augusta, Georgia includes the Savannah River Operations Office, Plant and Laboratory, and Ecology Laboratory. The entire program has directed its efforts to the resolution of long term energy goals that possess local and national implications. The Savannah River program has sought to develop an extensive public affairs program and relationsips with the news media, state and local governments, and leaders in the community in an effort to create citizen participaton. The program operates through numerous contracts, 190 with universities, hospitals, government agencies, and private industry, as well as through E.I. du Pont de Nemours and Company and the University of Georgia's Institute of Ecology. The information acquired on the Savannah River Plant and its components was derived from an April 1977 publication by ERDA, Resources and Capabilities of the Savannah River Plant. In addition to describing the functions of each facility, the ERDA report endeavors to define the program's potential capabilities in the nation's future energy goals.

Savannah River Operations Office

The Savannah River Operations Office has provided energy related project management for 25 years. This organization participates in programs designed to meet and solve national energy goals including research and development, production of nuclear materials, and environmental research. The Savannah

River Operations manages several activities, all energy related and created to resolve current energy problems. These activities include:

a) Nuclear Energy- This program studies technological developments, reactor operations, radioactive waste management, and environmental consequences of nuclear activity.

b) Fossil Energy- This program examines trace elements resulting from coal ash, productive uses of ash, data studies applicable to offshore oil drilling and nuclear power plants, and new approaches for revitalizing disturbed lands.

c) Solar Energy and Biomass Utilization- This program studies solar power and pine resin production.

d) Fusion-Energy- This activity is involved in the production, handling, and cycling of tritium.

e) Conservation- This program utilizes waste heat to stimulate biological activity.

f) Application of Energy Technologies- This program studies water environments and the effect of waste heat, land uses, and ecosystem processes.

According to an ERDA publication in April, 1977, the staff of the Savannah River Operations Office totals 193. Professionals with backgrounds in engineering and the sciences are added with degreed and experienced personnel in management, law, finance, audit, contracting, property management, personnel and security to assume 128 of the 193 positions. Remaining staff include clerical workers, quality assurance, and courier personnel. A paraprofessional program is also functioning.

Savannah River Operations Office administers programs in Waste Management, Light Water Reactor Fuel Cycle Evaluation, National Uranium Resource Evaluation, U.S. Forest Service, and a National Environmental Research Park.

The Waste Management program is concerned with the handling of liquid, solid, and gaseous radioactive wastes in ways that are not contrary to employee or environmental well being. The Fuel Cycle Evaluation Office, formed in 1975, provides information for the evaluation of methods designed to utilize spent nuclear fuel to benefit energy production. The National Uranium Resource Evaluation (NURE) program surveys 25 states in the eastern United States to examine uranium resources. The U.S. Forest Service performs several functions including research studies in the protection of land resources, increasing resin production in pine trees which, in turn, may result in release of petrochemicals used in energy needs, and appropriating habitat conditions suitable for wildlife. The National Environmental Research Part (NERP) uses the Savannah River to observe ecosystem changes created by environmental disturbances.

ERDA presented a positive view of the future of the Savannah River Operations Office. Because of successful programs in the past and present it is believed the Operations Office will continue to be a center for the nation's research and development as well as a site for further experimental facilities. ERDA stated that the current staff of engineers and scientists could support test stations.

Savannah River Plant and Laboratory

The Savannah River Plant, completed in 1956, was constructed as a center for nuclear operations. The Plant's activities are defense oriented with peacetime applications. The plant, operated for the ERDA by E.I. du Pont de Nemours and Company, also includes the Savannah River Laboratory and the Construction Division of Du Pont's Engineering Department. These divisions operate as separate entities but are considered part of the Du Pont Corporation.

Combined, the plant, laboratory and construction division employ approximately 6,000 people. More than 1,000 of these people hold degrees, most of which are in mathematics, engineering, life sciences, and physics. Of the Du Pont staff, 135 employees hold doctoral degrees. Approximately 3,000 individuals are employed in non-professional areas such as reactor operators, laboratory technicians, mechanics, health physicists, inspectors, and other. The security force at the plant numbers 260 employees while the construction force varies between 500 and 1200 members depending on the task.

The River Laboratory provides supportive services for the River Plant and other ERDA organizations through research and development studies. The consequences of the studies have been increased production, an out standing safety record, and reduction of the environmental effects of plant operations. At the same time, much of the environmental research conducted through the laboratory is described as having regional and national implications in energy. The research and development studies are creating varied processess and peacetime applications of nuclear energy.

The ERDA report describes eight of the plant's facilities. Included are Chemicals Separation and Waste Management facilities. The former separates and purifies reactor products while the latter deals with the high level liquid alkaline waste derived from chemical separations areas.

The Savannah River Plant and Laboratory are qualified to undertake several energy programs in the future. The activities include a) Energy Storage Systems, b) Magnetic Fusion Energy, c) Fossil Energy, d) Reactor Siting, e) Optimized Cooling Pond Design, f) Cleaning Effluents from Energy-Producing Plants, and finally, g) Actinide Burnup.

The Savannah River Ecology Laboratory

The Savannah River Ecology Laboratory (SREL), a research facility located on the Savannah River Plant, is operated by the University of Georgia through a contract provided by ERDA. The research at this facility as described by the ERDA is divided into four areas:

1) Studies of mineral cycling in ecological systems.
2) Environmental effects of thermal waters
3) Studies of basic and theoretical ecology
4) The radioecology of transuranic elements

The Thermal Ecology program studies the environmental impact of the release of cooling water from the River Plant's production reactors. Results of this program mav be applied to other water dischargers by industry.

In the Mineral Cycling program investigators study the movement of heavy metals, radioisotopes and other toxic materials through natural communities in the coastal plain area.

SREL employs 38 personnel with degrees in Biology. Of the 38, there are 14 doctorates, 13 masters, and 11 bachelors.

The numerous accomplishments of the SREL have been published and have supplied insight into the effect of thermal effluents on aquatic environments, the relation between swamp ecosystems and waste materials, and advanced ecological concepts.

ERDA describes the DREL as having potential for extensive studies beneficial to national environmental problems. Because of the facilities available, field and laboratory experimentation can be conducted simultaneously. The SREL staff is capable of studying the ecology associated with energy conservation in relation to biomass conversion programs.

Summary and Conclusion

The Savannah River Plant, selected as a major installation for a program in nuclear production and research by the Energy Research and Development Administration (ERDA), contains three divisions: the Savannah River Operations Office, the Plant and Laboratory, and the Ecology Laboratory. The three components working as a single unit have sought to resolve local and national energy goals.

ERDA, in its April, 1977, publication, Resources and Capabilities of the Savannah River Plant, stated that the future for the Plant looked positive for several reasons. They include: 1) past and present successful programs, 2) possible sites for further experimental facilities, 3) adequate staff of engineers and scientists to support further test stations, and 4) simultaneous field and laboratory experimentation made possible by present facilities.

Officials at the Savannah River Plant stated that 85% of pollution control personnel including technical graduates, chemists, chemical engineers and other employees with backgrounds in physics, biology, and sanitary engineering are concerned with containment and monitoring of radioactivity. Details of work performance are described in the following table:

TABLE XIV

Savannah River Plant-Savannah River Laboratory
1976 Person-Years on Pollution Control

	Air	Land	Water	Multi-Media	Radioactivity	Other	Total
Monitoring	28	13	31		60	12	144
Planning	16	4	10	7	30	7	74
Technical Support	21	4	13	29	61	6	134
Total	65	21	54	36	151	25	352

Officials also stated that the workforce at Savannah River Plant will have a modest increase of 4% by 1981. This percentage deals concurrently with all areas of pollution control.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Oak Ridge, Tennessee, and Paducah, Kentucky

The United States Government has three Energy Research and Development (ERDA) installations at Oak Ridge, Tennessee, which are operated by the Union Carbide Corporation. These three installations include the Oak Ridge National Laboratory, the Oak Ridge Y-12 Plant and the Oak Ridge Gaseous Diffusion Plant. Also, at Paducah, Kentucky, Union Carbide operates the Gaseous Diffusion plant for the Energy Research and Development Administration. All four installations together employ a total of 16,000 Union Carbide employees.

While the task of the Gaseous Diffusion Plants is to enrich natural uranium U-235 to produce the more stable and abundant U-238 on a production scale, the Y-12 plant is involved in such things as parts fabrication and advanced engineering. The research facilities at the Oak Ridge National Laboratory are currently researching ways to develop domestic nuclear power as an alternative source of energy.

There are a total of twenty-three people working in all aspects of pollution control activities at the Union Carbide facilities in Oak Ridge and Paducah. One person works in the Energy Research and Development Administraion's Safety and Environmental Control Division and is responsible for overseeing the activities of Union Carbide Nuclear Division's Safety and Environmental Protection group.

The Safety and Environmental Protection group consists of three persons who serve in an advisory and coordinating capacity for Union Carbide's three plants and laboratory. Their function is to keep abreast of the EPA discharge regulations, laws and limits on waste disposal levels. In furtherance of this responsibility they occasionally visit other corporations to see how they handle pollution problems.

At the two Union Carbide Gaseous Diffusion Plants in Oak Ridge and Paducah, the Plant Managers serve as environmental control officers. Two Environmental Technicians work with them to assure that these plants conform to EPA regulations.

The Oak Ridge Y-12 Plant Manager also is responsible for that facility's being in compliance with EPA regulations. The two technicians previously referred to are also available to assist the Y-12 Plant Manager.

The Union Carbide Assistant Director for Services also has a direct coordinating role for environmental protection activities at Oak Ridge. The Assistant Director can call on a pool of approximately 50 engineers to assist the Plant Managers on pollution control and abatement problems from time to time as the needs arise.

At the Oak Ridge National Laboratory, seven people work in the Health Physics area to perform environmental monitoring functions. Five of these seven are professional health physicists, and the remaining two are technicians who assist them. This section is responsible for ensuring that no unacceptable radiation levels exist at the National Laboratory that could prove a health hazard to personnel. Two groups within the Health Physics section perform monitoring functions. One is the Radiation Survey Group which measures radioactive emissions on the laboratory facilities. The other is the Environmental Monitoring Group of Health Physicists who measure radiation releases to the environment outside the facility. They take grass and milk samples at farms, for example, and operate air monitoring sites within a 75 mile radius of the National Laboratory. Health physicists also monitor all radiation producing machines except lasers for leakage, and control the treatment and disposal of radioactive waste materials.

The other major classification of personnel at the Oak Ridge National Laboratory that performs environmental monitoring functions is the Industrial Hygienist Group. This group consists of two professional industrial hygienists and two technicians. The technicians perform such tasks as routine operations of monitoring devices, and do sample analytical work for the professionals. Only one person in this group works full time on environmental monitoring activities, however. The industrial hygienist professionals are increasingly involved in control of carcinogens and other industrial chemicals.

The Nuclear Division of the Union Carbide Company's Safety and Environmental Protection group also oversees four committees, each representing one of the three Union Carbide plants and the National Laboratory. These committees are:

1) UCC-ND Environmental Monitoring and Protection Committee
2) UCC-ND Industrial Hygiene Committee
3) UCC-ND Safety Committee
4) UCC-ND Medical Director Committee

The first three committees are each composed of one representative from the Oak Ridge National Laboratory, the Oak Ridge Gaseous Diffusion Plant, the Y-12 Plant, the Paducah Gaseous Diffusion Plant and the Engineering and Technical Divisions. The Environmental Monitoring and Protection Committee has the most direct impact on ongoing environmental protection and monitoring activities, and has responsibility for keeping guidelines, initiating projects, monitoring, collecting data and developing procedures for disposal of chemicals.

As far as activities at the two Gaseous Diffusion Plants and the Y-12 Plant are concerned, it is projected that the level of persons employed directly to work on environmental protection and monitoring activities will stay at roughly the same level over the next five years. The principal reason for this no growth situation is the availability of 50 Union Carbide engineers who can be transferred to specific areas as the needs arise. Because meeting environmental regulations is a continuous activity, a shrinkage in numbers of personnel actively engaged in environmental control work is not expected over the next five years.

The Union Carbide Company largely utilizes academically degreed personnel to perform environmental pollution control work. Engineers are preferred, as they are considered to have undergone more rigorous or systematic training for problem solving and problem identification. Additionally, prefference in hiring would be shown to those with experience working a disposal or waste water sewage treatment plant.

The Union Carbide Company does not have any formal training program developed for its environmental control personnel. If these technicians or engineers require additional training, the Union Carbide Company would consider sending them to an adequate institution or a short course.

Of the environmental control and abatement personnel currently employed by the Union Carbide Company at Oak Ridge and Paducah, only the industrial hygienists and health physicists are expected to increase in any significant numbers in the next five years. It is expected that of the two groups, the industrial hygienists will probably have the best career potential at the Oak Ridge National Laboratory for the next five year period. The Industrial Hygienist Group, including technicians is projected to grow at an annual rate of 7% and increase in number from a total of seven persons to ten people by 1982. The rest of the personnel at the National Laboratory including the Health Physics Group, are expected to grow during the next five years at an annual rate of 6%. The principal reason for the higher percentage growth of the Industrial Hygienist Group is the increased public concern of the proper treatment and disposal of possibly hazardous industrial chemicals such as carcinogens. Total average turnover for both occupational groups is less than 3% annually.

The following table represents projections, based upon best professional judgments, for degreed personnel in the fields of health physics and industrail hygiene and includes technicians.

TABLE XV

Workforce Projections to 1982 (est.)
for Health Physicists and Industrial Hygienists
at ERDA Facilities

Position	1976	1977	1978	1979	1980	1981	%/annum growth (average)
Health Physicist	7	7	8	8	9	10	8%
Industrial Hygienist	4	4	5	5	5	6	9%
TOTAL	11	11	13	13	14	16	8%

FEDERAL ENERGY ADMINISTRATION

Atlanta, Georgia

The Federal Energy Administration (FEA) receives its authority from the Energy Policy and Conservation Act of 1975. This Act amended the Emergency Allocation Act, the Federal Energy Administration Act, and the Energy Conservation and Production Act.

Functions of the Region IV FEA office can be divided into three main program areas: Conservation and Energy Resource Development, Compliance and Investigations, and Operations. In order to carry out these functions, FEA has been divided into seven major components, under the direction of a Regional Administrator and a Deputy Regional Administrator. These major components, their workforce levels and their functions include:

1) Office of Regional Counsel: This group of six lawyers reviews all litigation in which FEA is involved, reviews all but Exceptions and Appeals orders for determining legal sufficiency, and assists all other Divisions regarding legal matters.

2) Management: This is a support group which handles all purchasing, payrolling, and personnel. It also houses the communications center. These eleven employees consist of clerical staff and specialists in the areas of property, telecommunication, payroll, financial management, and travel.

3) Compliance and Enforcement: These ninety-six people are mainly located within the States, and see that those who have been allocated propane and motor gasoline by FEA understand the Law and are complying. They conduct audits and see that price controls are in effect. Ninety percent of these personnel are accountants, mainly degreed.

4) Exceptions and Appeals: After an allocation has been made, if an appeal is made or an exemption filed, this office handles the case. The staff includes one lawyer, two paraprofessionals, and a secretary.

5) Operations: This Branch actually allocates the fuels (propane and motor gasoline), and consists of 24 people, all from non-degreed general backgrounds.

6) Office of External Affairs: This office contains a Congressional Liaison Specialist, and eight Intergovernmental Specialists that deal with the eight State governments in the Region. Most of these people have general college degrees.

7) Conservation, Environment, and Energy Resource Development: The Functions of the Conservation component include giving and receiving grants for State energy programs under the Act. All Environmental Impact Statements and Environmental Assessments in the Region that pertain to energy are also reviewed. The Energy Resource Development group looks for new ways to develop energy resources, and watches for delays, functioning as a negotiator in power production legalities. They additionally work with States in developing and converting to new power sources. The Conservation and Environment group has six employees, while Energy Resource Development employs three. Persons in the former group all have general college backgrounds, while the latter contains a ceramic engineer, an industrial management specialist, and a scientist.

Although there are 164 employees presently with FEA, it is anticipated that by the end of Fiscal Year 1977, there will be only 133. The major portion of the cut will be from the Operations Division, as the Agency has become decreasingly involved in fuel allocations since the energy crisis has ended. Hearings will be held in the near future regarding the de-control of motor gasoline, which would leave only propane to be allocated.

The only component that might grow is the Conservation, Environment, and Energy Resource Development Division. One reason for anticipated growth is that there will be an increasing amount of impact in the area of conservation, and States will be requiring more assistance in the implementation of their programs. A weatherization program may be implemented during Fiscal Year 1977, which would require additional personnel in the Division. Three new positions for persons with physical science degrees are anticipated to be needed, according to best professional judgments.

Projections beyond 1977 are impossible for administrators to make at this time, as FEA is programmed to terminate on December 31, 1977. A renewal, of course, is possible, but not guaranteed, and is contingent upon a multitude of factors.

FEDERAL POWER COMMISSION

Atlanta, Georgia

The Federal Power Commission operates a regional office in Atlanta, Georgia,which serves as a liaison between the agency's Headquarters office in Washington, D.C.,and electric utilities in the Southeast. The office deals with utilities in all of North Carolina, South Carolina, Florida, Georgia and Alabama, most of Tennessee, and parts of Mississippi and Kentucky.

Regulatory control of utilities is maintained at the Headquarters office. However, this office reviews and tabulates forms prepared by utility companies, which are forwarded to Washington, D.C. Staff personnel also inspect hydroelectric projects to ensure that they are meeting safety standards and quality control guidelines. Sources indicate that few functions relating to pollution control are carried out in this regional office, except in reviewing forms filed by utilities that specify the amount of thermal and air pollution generated by the plants. These forms are also forwarded to Washington, D.C.

The office employs 18 persons, consisting of a regional engineer, a deputy regional engineer, five electrical engineers, five civil engineers, one recreational officer and five clerical employees. The civil engineers inspect hydroelectric projects to ensure that they are meeting guidelines. Electrical engineers check the adequacy of interconnecting systems, such as transmission lines. The recreational officer is responsible for assuring the safety of recreational areas on the reservoirs of hydroelectric projects.

Professionals in the office express a need for additional civil engineers. There are currently about 85 operating hydroelectrical projects that must be inspected annually. In addition, new projects are under construction which require inspection at least monthly. Specific workforce projections, however, will be difficult to provide until the federal administration releases plans regarding the future of federal energy-related agencies.

NUCLEAR REGULATORY COMMISSION
Atlanta, Georgia

The Nuclear Regulatory Commission (NRC) began operation in January of 1975 as a result of the Energy Reorganization Act of 1974. This Act transferred to NRC the responsibility for carrying out the regulatory provisions of the Atomic Energy Act of 1954, as amended. These provisions established a framework for regulating civilian nuclear energy activities to ensure that they are conducted in a manner which will protect public health and safety, maintain national security, and comply with antitrust laws. Under the National Environmental Policy Act of 1969, the Commission also assumed responsibility for evaluating the nonradiological as well as the radiological impact on the environment of major nuclear facilities proposed for licensing, and for balancing the benefits of such facilities against their environmental and social costs.

As a result of the Energy Reorganization Act, NRC was charged with several additional specialized tasks. For example, it authorized the Commission to administer a strong regulatory research program, to license and regulate certain nuclear waste management activities, and to conduct extensive studies on safeguard needs and the feasibility of nuclear energy centers. NRC was also directed to increase significantly the emphasis placed upon safeguarding strategic nuclear facilities against theft.

The Headquarters office of NRC is located in Bethesda, Maryland, and five regional offices are in operation. The Region II office, located in Atlanta, Georgia, directs certain nuclear activities in Tennessee, Kentucky, Alabama North Carolina, South Carolina, Georgia, Mississippi, Florida, Virginia, West Virginia, Puerto Rico, the Virgin Islands, and the Panama Canal Zone. All of these areas but the latter five have entered into agreements with the NRC, as authorized by Section 274 of the Atomic Energy Act. Under the agreements, these States have assumed regulatory authority over radioisotopes, source materials, and special nuclear materials in quantities not sufficient to form a critical mass.

In the Region II NRC office, activities are concentrated in the areas of inspection and enforcement, as they pertain to planning, construction, start-up, and operation of nuclear power plants. Although the Headquarters office issues permits for construction and operation of nuclear power plants, the Regional office is responsible for inspection, surveys, and approval/disapproval actions during the entire process. Associated duties take place in the areas of fabrication, security, and storage.

The Reactor Construction and Engineering Support Branch contains a pool of engineers and concrete specialists that inspect facilities under construction after a permit to construct has been issued. Similarly, the Reactor Operation and Nuclear Support Branch is responsible after a permit to operate has been issued. This Branch consists mainly of nuclear engineers, many with Navy backgrounds.

Special functions are performed in the Fuel Facility and Materials Supply and the Safeguards Branches. Chemists and health physicists in the former assure safety to employees in the facility by maintaining systems for the handling and use of the fuel, while personnel in the Safeguards Branch are concerned with plant security, the safe transportation of nuclear materials, and material control in fabrication plants.

These Branches along with the Administrative and the Public Affairs offices employ a total of 108. An estimated 80% of these staff members are professionals from such backgrounds as nuclear, electrical, and civil engineering, health physics, and chemistry.

No new areas of involvements are presently foreseen, nor is a shift in priorities anticipated. As projected by NRC professionals, Region II activities will continue to be focused in the areas of inspection and enforcement. As the planning activities for additional nuclear reactors are presently taking place by power companies, staff increases at NRC could very well occur as a result. However, no specific staffing level predictions can be made until U.S. policy decisions are promulgated regarding the future of nuclear energy in the country.

SUMMARY

The need for staff growth was voiced by professionals in nearly every EPA program area that was assessed during the course of this study. On the surface, at least, it appears that these people are less optimistic concerning the actual attainment of these needed positions than is the EPA Headquarters office. The overall EPA five-year plan indicates that there will be an addition of over 2,100 positions to the Regional Office staffs during the next five years. As Region IV generally receives approximately fifteen percent of the positions that are allocated to the Regions, it would appear that this Region would increase by approximately 315 positions over this period of time. Combined estimates of interviewed professionals in the Region, however, predict the addition of less than 150 staff members within the specific program areas under study. Several reasons for this apparent discrepancy exist.

First, as mentioned earlier, specific persons or entire components in some cases cannot be categorized by program area, as they serve a supporting function to several or all EPA components, e.g., the Management Division. Additions in certain or all EPA components may not be entirely accounted for in the individual reports. Secondly, the author found a tendency on the part of those interviewed to make predictions based upon hard needs, rather than to project optimum growth rates. Finally, workforce implications of the recently-passed Toxic Substances Control Act have not yet been discussed in this report.

Region IV administrators have anticipated staffing needs and organizational plans for implementation of the toxic substances control program. Organizationally, a Toxic Substances Coordinator and a secretary will be located in the Regional Administrator's office for coordinating EPA's Divisions for investigations of industries and sample-taking. In addition, the Pesticides Branch will perform such duties as the administration of State Grants, the monitoring of the importation and exportation of pesticides and toxic substances, the processing of industrial reports and the evaluation of laboratories. Routine inspections will also be performed for assuring that products are properly labeled, and orders to stop sale will be issued when needed. The Toxic Substances Coordinator will not exert direct control over this Branch, but will utilize its personnel when needed, in coordination with personnel from other EPA components for reacting to defined problem situations.

Administrators had projected a need for eighteen positions in Fiscal Year 1977 for implementation of the program. This number includes the Toxic Substances Coordinator and a secretary, and ten consumer safety officers and two clerical employees in the Pesticides and Toxic Substances Control Branch. Only one of these positions, for the Toxic Substances Coordinator, was granted. Administrators further project that 32.7 person-years will be required in Fiscal Year 1978 and 49.5 in Fiscal Year 1979. Workforce impacts will become increasingly apparent as implementation of the Act commences.

Taking this new program into account, nearly 200 additional persons are expected to be created in these eight program areas in the next five years. While in Fiscal Year 1976, the number of engineers exceeded the numbers of persons in the categories of "scientist", "technician", and "other", combined projections suggest that by 1979 the number of scientist may exceed the number of engineers. Further, although the number of technicians will remain comparatively small, its annual growth rate will be higher than that for engineers.

The following table depicts approximations of future EPA workfoce levels. Data from individual reports have been combined, and projections concerning toxic substances have been included, with the assumption that a workforce stabilization will occur by 1979.

TABLE XVI

U.S. EPA REGION IV: WORKFORCE PROJECTIONS TO 1982 FOR THE AREAS OF AIR, NOISE, PESTICIDES, POTABLE WATER, RADIATION, SOLID WASTE, TOXIC SUBSTANCES AND WASTE WATER

Position	1976	1977	1978	1979	1980	1981	% Average per Annum Growth/Decline
Engineer	122	133	144	152	156	159	5%
Scientist	90	106	144	167	173	178	15%
Technician	24	29	36	40	43	44	13%
Other	49	58	70	78	80	84	12%
Total	285	326	394	437	452	465	10%

More specifically, these increases are projected in the following manner (excluding toxic substances, which was previously discussed):

a) Air programs personnel project an overall ten percent increase in environmental engineers and air resource planners;

b) The noise program may increase its staff of two to four;

c) An annual 8% growth rate is expected for pesticides, to include chemists, technicians, consumer safety officers and administrative aides;

d) Potable water program personnel project an annual 21% staff growth rate, and new personnel will include sanitary and environmental engineers, technicians, toxicologists, and professionals with expertise in underground injection control;

e) The environmental radiation program staff may increase from three to eight. Additional personnel will include nuclear engineers, health physicists, a radiochemist and laboratory personnel;

f) The staffing level for solid waste activities is expected to increase from five to approximately thirty, and new positions will include chemical and sanitary engineers, environmental specialists and clerical employees;

g) An annual 6% growth rate is projected for wastewater program operations, and increases are projected for planners, contract auditors, engineers, technicians and scientists in fields related to groundwater, toxic substances and radiation.

Numbers of persons required for full effective implementation of programs is necessarily affected by the structure of the organization in which employees function and the system under which they must operate. During the course of interviews with regional program personnel, the author noted some concern that employee potential is not always impacted to its fullest possible extent. Based upon feedback from these professionals, it appears possible that certain adaptations in the administrative system could cause a more complete utilization of skills and expertise available, whereby the chain of command becomes more flexible and employees receive a greater amount of recognition for achievements. If employee potential could be utilized to a greater extent, workforce needs may necessarily be reduced.

A second concern voiced by administrators and program personnel in Region IV EPA is the lack of technical upgrade training opportunities available to staff personnel, in large part due to a shortage of travel funds and a decreasing emphasis at Headquarters EPA in the realm of training. Management and administrative courses are often offered as substitute for technical courses, as are professional association meetings, as budgets will allow, and informal on-the-job training.

To assist States in implementing their own pollution control programs, EPA professionals feel responsibility for assisting the States with the provision of technical assistance but are faced with limited resources. To provide this assistance at a minimal cost, the EPA air, radiation and solid waste programs have organized and implemented regional training committees. Through these committees, Federal and State administrators identify training voids and prepare and conduct appropriate courses for program personnel throughout the Region. Region IV EPA does offer direct formal training in air, waste water, and pesticides, and training plans and programs are being developed in the area of potable water by Headquarters, in cooperation with the Regions. According to Regional officials, State training voids are still in existence, and needs include training for State pesticide laboratory personnel and training regarding new and unique waste treatment procedures. The recent passage of the Resource Conservation and Recovery Act will require the availability of extensive training in the areas of hazardous wastes and resource recovery for State personnel, some of which will be provided by the Regional Training Committee.

In sum, Region IV EPA officials have projected an increasing need for qualified personnel to carry out mandated responsibilities and have voiced concern that technical training opportunities available to EPA and State regulatory personnel are not meeting the needs. Within budgetary constraints, officials appear to be attempting to maximize resources, especially to provide technical assistance to Region IV States. Resources, however, are not abundant, and many of those interviewed expressed concern that the purposes of the pollution control Acts may not be adequately fulfilled. In contrast, the Regional Five Year Plan contains the following comment: "Let's be optimistic and say we foresee no major problems (short of wholesale budget or new legislative constraints) which effective Agency management cannot overcome".

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